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STEEL

ESTABLISHED 1882

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PRODUCTION • PROCESSING • DISTRIBUTION • USE

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HIGHLIGHTING
THIS ISSUE OF
STEEL

■ NOT ONLY steel, but all critical materials are to be placed under an "all-out" allocations system, SPAB announced **(p. 29)** last Friday. OPM has been requested to obtain "detailed production programs, industry by industry, for 1942." These programs will be worked out with a committee representing each industry; the system definitely will take into account the requirements of purely civilian industries. While "a good deal of time" will be required to get the entire program into effect, an approach will be made Dec. 1 when PD-1 preference rating applications will be handled by a new method . . . Planning for the post-war period is a "must" job for today, counsels Walter D. Fuller **(p. 59)**.

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"Give Us More!"

Plagued by the scrap shortage, sitting atop the closed-shop volcano, the steel industry comes up for questioning at Washington tomorrow **(p. 31)** as to how it can get out greater production. Plate producers had their inning last week; when complaints were made that plate tonnage is less than it should be, the answer in part was **(p. 32)** that the defense orders are placed in an irrational manner that cripples the effectiveness of the mills. Guy Hubbard, STEEL's machine tool editor, also shows how ill-advised defense procurement procedures hamper full production of machine tools . . . Joint United States-Canadian defense production committee now is co-ordinating the capacities **(p. 38)** of the two countries.

◆ ◆ ◆

Reduce Styles

The Fair Labor Standards Act **(p. 38)** has been amended; reduction of 40 per cent applies to metal furniture output . . . All manufacturers **(p. 40)** are asked to cut down on styles and sizes; additional machinery manufacturers and makers of copper wire and cable are asked to freeze prices; Treasury Department is paying above-ceiling prices for high-cost Michigan copper . . .Shortages are hitting low-priced jewelry manufacturers **(p. 30)** . . . Cobalt **(p. 41)** is under allocations . . . Aluminum scrap price schedule has been amended **(p. 42)** . . . Restrictions against use of copper in building construction **(p. 43)** have been eased; zinc alloy prices are under ceilings; used steel drum prices will be frozen . . . Washer and ironer industry will make machine gun parts **(p. 51)**.

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Getting More From Equipment

The "Tommy" gun, one of the best known of the various submachine guns, is analyzed **(p. 66)** this week by Professor Macconochie. . . . In these days of scarcity of machine tools and other equipment, recommendations on "how to do more with what you have" **(p. 70)** are particularly timely, especially since these have proved out in practice and are not mere theories. . . . An ingenious arrangement for sorting castings **(p. 80)** offers a solution to one materials handling problem. . . . William Melas describes **(p. 82)** several methods of measuring pulsating flow.

◆ ◆ ◆

Upping Blast Furnace Output

Six months' operating data **(p. 88)** on a 1300-ton blast furnace equipped with a 3-grain precompression air-conditioning system disclose a more uniform working furnace, a reduction in amount of coke per ton of iron and increased iron production, according to E. K. Miller. . . . Resonant vibration testing using powerful new electromagnetic exciters is described **(p. 64)** by R. O. Fehr and Carl Schabtach. It extends scope of fatigue testing. . . . Panel construction of new forced-convection furnace **(p. 72)** speeds erection. . . . Raymond Loewy discusses **(p. 102)** effect of priorities on design trends.

INLAND

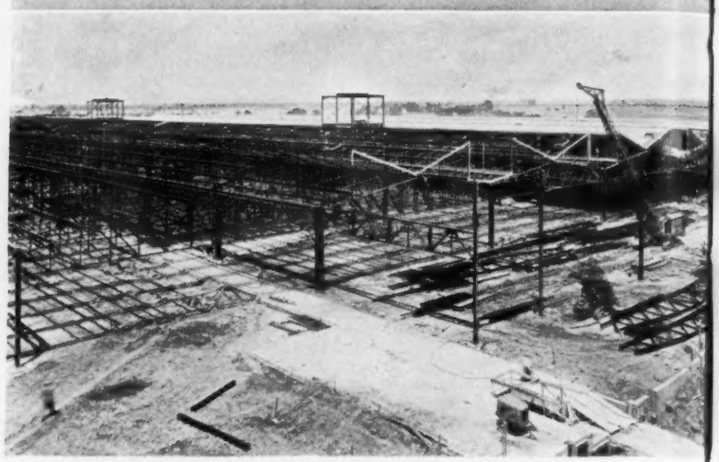
Is Helping Put American Bombers *in the Air*

Speeding production of steel for the construction of bomber assembly and motor plants is typical of Inland's participation in America's Defense Program. Thousands of tons of Inland steel have gone into the Studebaker and Buick airplane motor plants at Chicago, and into many bomber plants throughout the country.

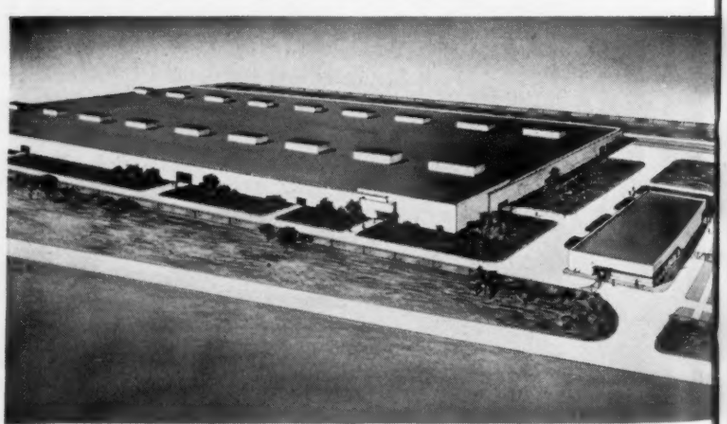
Among the products which Inland furnishes for these and for many other defense construction projects are structural shapes for columns and girders, bars for concrete reinforcement, rails for switch tracks, and sheet steel for ventilating equipment and roof decking.

The projects illustrated here are examples of the splendid manner in which so many of our leading corporations, normally engaged in "non-defense" work, are cooperating in the Defense Program.

As for Inland, every phase of our business is geared to this one great purpose. Our mills are setting new production records; our schedules are being constantly made and re-made so that steel for our Country's Defense will be delivered when and where needed. Yes, National Defense is Inland's No. 1 Job!



Buick's new plant will soon be building a thousand airplane motors a month. Into its construction Inland rushed more than 6,000 tons of steel.



Ten days after the order was received Inland began delivery of 4,000 tons of structural steel for this huge Studebaker plant for airplane motor parts. Three weeks later shipments were completed.

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Allocation Program To "Give Greater Security to American Industry"

✦

SPAB outlines development of plan . . . Will be built up through OPM industrial branches, working in co-operation with services and other defense agencies . . . To cover all critical materials

✦

WASHINGTON

■ A JOINT move by OPM and the Supplies Priorities and Allocations Board in preparation for allocation of all critical materials throughout industry was announced last week by the board. It stated:

"In setting its sights for this all-out allocation program, SPAB laid down the principle that where feasible the allocation program should be developed in such a way that minimum quantities of the needed materials would be assured to essential industries whose operations are curtailed.

"SPAB announced it had authorized its executive director to request OPM to obtain detailed production programs, industry by industry, for 1942.

"It stipulated that these programs should contain ample information to indicate the month-by-month requirements of critical materials needed for the production of military, industrial and civilian items, and essential public services.

"It also directed that these programs should show similar requirements for repair parts and capital expenditures.

"OPM issued an administrative order setting up the machinery by which the whole program of requirements is to be developed, outlined the manner in which the various industrial branches and other units of OPM are to work together toward this end, and instituted a new system of handling preference ratings in harmony with this program.

"It will, of course, take a good deal of time to get the entire program into effect. As it gradually emerges, however, the program will give greater certainty to American business and industry and it will also mean that defense officials will have a clearer over-all picture of the nation's total requirements for raw materials, SPAB having previously authorized its executive director to get detailed requirement statements for the armed services, merchant ship program and lend-lease.

"In substance, the development of an allocation program will proceed roughly as follows:

"An industrial branch in OPM takes the first step, calling on its several sections to develop requirements programs for each industry which manufactures the products for which the branch is responsible.

Originates in Industrial Branches

"Each program is built up by the branch or by its section through consultation with the industry advisory committee involved and also through discussion with either or both of the armed services, depending on the nature of the product and the materials used in its manufacture.

"When this has been done the officers of the industrial branch who have the program in charge discuss the entire matter with the industrial branches having jurisdiction over the materials or the products out of which the article in question is made. Agreement is reached between the branches as to the amount of material which can be allocated.

"As an example, a program for the manufacturers of plumbing equipment would be initiated in the plumbing and heating branch of the Division of Civilian Supply. It would be worked up in consultation with the industry and cross-checked to see how the military requirements might affect it. Then when it had been put in shape, it would be referred to the various raw materials groups — iron and steel branch, copper branch, etc., for a follow check.

"In effect, each program would originate with the group responsible for the end of product, with the raw materials groups coming into the picture in an advisory and consultive capacity. Since all programs must of necessity be reduced or expanded as armament production rises, each one will be framed so that it can be modified upward or downward in case of need. When a program has been drawn up it will be reviewed carefully in order to cut down the use of critical materials to the greatest possible extent through simplification of lines, substitutes, and so on. The OPM Bureau of Industrial Conservation will work with and through the industrial branches to accomplish this.

"When the program drawn up along these lines has been agreed upon by the branches involved it will be presented to the executive director of SPAB for proper synchronization with other programs. It is then presented to SPAB. After SPAB has passed on a program, either approving it, modifying it or taking such action as is deemed advisable, the program is referred to the OPM Priorities Division, which undertakes to make it effec-

tive and where possible to make sure that the needed quantities of goods will in fact be available, through the issuance of the required priorities ratings or through allocation of materials.

"In order that current operations may dovetail properly into the whole broad project, OPM's administrative order devised a new routing system for handling of PD-1 preference rating applications, effective Dec. 1. Details of this system are described in the attached copy of the order:

"Nov. 4, 1941, Administrative Order No. 29:

"To all officers and employes of the Office of Production Management.

"Subject: Functions of industrial branches with respect to programs of industrial requirements and applications for preference ratings.

Develop Requirements Program

"1. It is the policy of the Office of Production Management to develop a program on requirements for the different industries of the country. Each industrial branch should immediately undertake the development of such programs for the industries manufacturing the products for which it is responsible. When such programs are developed, they should be discussed with those industrial branches responsible for the material or products required. On the basis of agreements reached as a result of these conversations, the industrial branch that has developed the program in the initial instance shall be given allotments of necessary material and products and shall be responsible, through priorities or allocations procedure, for the final disposition of these allotments among the industries manufacturing the products for which it is responsible.

"2.—Effective Dec. 1, 1941, every application for preference rating PD-1 shall be initially routed to the industrial branch handling the product manufactured for the service rendered by the applicant. That branch will review the importance and general desirability of obtaining the applicant's product or service; indicate the approximate date on which the required materials should be delivered; and indicate the preference rating to be assigned.

"The application shall then be forwarded to the branch handling the product or service for which the applicant's product will be used and to those branches handling the required materials. The branch responsible for the material or product required, if satisfied with the recommendation of the initiating branch, shall transmit the application to the Priorities Division for final review.

"If this branch is not satisfied with the recommendation an effort will be made by the branches involved to reconcile their differences. If common agreements cannot be reached, the application together with the recommendation of the branches involved shall be forwarded to the Priorities Division for final determination of the rating to be assigned.

"3. Until Dec. 1, 1941, applications for preference rating PD-1 shall be routed in accordance with the procedure now in effect. The branch receiving an application shall transmit the application together with its recommendation to the branch responsible for the principal product into which the material or product requested will flow.

"If the branches are in agreement, the application shall be forwarded to the Priorities Division for final review. In case of a disagreement the end product branch may cancel or lower the rating and transmit the application to the Priorities Division, advising the initiating branch of the change.

"If a higher rating is desired the end product branch shall confer with the initiating branch with respect thereto and failing agreement, their several recommendations shall be transmitted to the Priorities Division for decision.

"4. A representative of an industrial establishment shall be directed to the branch responsible for the product manufactured by his establishment."

"The order is signed by William S. Knudsen."

Truck Production Orders Extended to Jan. 31

Extension until Jan. 31 of the orders which facilitate production of heavy motor trucks, medium trucks and truck trailers has been announced by the OPM Priorities Division. The two orders extended are L-1-a and P-54.

Extension of the program does not change the basic provisions of the plan. It was undertaken so that manufacturers could place January orders for steel immediately.

Extension of order L-1-a means that during the period from Sept. 1, to Jan. 31, producers may manufacture five-sixths the number of medium motor trucks, truck trailers and passenger carriers produced during the first half year, except that trucks ordered for specific defense purposes as defined in the original order are not limited.

Production of heavy motor trucks, which are carrying most of the national defense truck transportation burden, is not restricted.

Extension also means that manufacturers of replacement parts may produce during the Sept. 1-Jan. 31 period the same number of parts as were sold for replacement purposes during the first half year.

Limited Preference Rating Order P-54 assigns an A-3 rating to materials going into heavy motor trucks (3 tons or more), medium motor trucks (1½ tons or more), truck trailers (5 tons or more), passenger carriers (motor or electric coaches with not less than 15 seats), and replacement parts as specifically listed in the original order.

SPAB Denies Priorities for Texas-New York Pipe Line

SPAB has ruled that priority ratings will not be issued for construction of the proposed national defense pipe line.

On Sept. 16 the board ruled against priorities for the steel plate out of which it was originally proposed to build the line. It left open, however, the question of permitting construction of the line if extruded pipe were used; and accordingly, a revised application was submitted by the Petroleum Co-ordinator calling for the use of seamless steel tubing in place of pipe made from plates.

In its action today, which constitutes a final disapproval of the pipe line project, SPAB held that the value of the pipe line as a defense project was not great enough to justify the high priority ratings that would be necessary.

SPAB recognized the importance of assuring the eastern seaboard region an adequate supply of oil, and requested the Petroleum Co-ordinator to explore the possibilities in other methods of getting oil to the seaboard.

Materials Shortages Hit Low-Priced Jewelry

■ Low-priced jewelry manufacturing industry, centered largely in the Providence, R. I., area, and including the Attleboros, Mass., is facing sharp curtailments by the end of the year as a result of material shortages, mostly brass and other nonferrous metals. Relatively little steel wire and alloy steel is fabricated in these plants.

While some plants normally producing cheap jewelry, retailed in chain and department stores, have taken orders for Army and Navy insignia, relatively few are in position to take on many defense contracts due to inadequate adaptable machinery.

Recent survey by the Providence Chamber of Commerce shows that 72 manufacturing companies forecast that of their 7901 workers, 5109 or 65 per cent, will be either out of work or working temporarily at some other job after Jan. 1.

Steel Men Summoned on Production, With Labor Issue Still Critical

OPM seeks "most effective" use of industry's facilities in arms program; CIO sees emergency as opportunity to enhance "union security" with closed shop

WASHINGTON

■ WHILE full operation of the country's steelmaking facilities continues to be threatened by labor disputes and by materials shortages, representatives of leading steel companies will convene in Washington this week to discuss with OPM officials "how the industry can most effectively operate in carrying out its vitally important part in the armament program."

Invitation to the conference, to be held Nov. 11, was extended by A. D. Whiteside, chief of the OPM Iron and Steel Section. Government spokesmen will present to the industry its plan regarding the procedure to be followed for the coming months and to forecast to the extent possible requirements for materials of which steel is all or a component part of the final product.

Six representatives of the industry will speak concerning various phases of the iron and steel situation. OPM has asked 225 mill representatives to attend.

While defense officials and steel producers are thus seeking ways and means to assure an adequate supply of metal for the arms program, another government agency, the National Defense Mediation Board, ponders a problem, the solution of which may have a profound effect on the steel industry's ability to produce the needed materials. That problem is whether or not a union shop should be recommended for the captive coal mines.

■ **Members of the mediation board meet with United Mine Workers' president, John L. Lewis, and steel company representatives to discuss Lewis' demand for union shop in the steel companies' captive coal mines. Above, the OPM slogan, "Time is Short", adorns the entrance to the board's conference room. NEA photo**

May Strike Again

Now working under a truce which expires this week—Nov. 15—John L. Lewis' United Mine Workers may strike again if the demand for a closed shop is not granted. With coke and coal supplies at a low level —reduced by earlier strikes—a new stoppage of mining would quickly cut steel production.

If, however, the union shop is granted in the captive mines, the CIO is expected to press its demands for similar agreements for the steel mills.

With most producers adhering to the policy that union membership should not be made a condition of employment, a drive for the closed shop throughout the industry holds potentialities for more delays.

In Washington it is generally believed the mediation board would be willing to recommend the union

shop for the captive mines if the union shop issue could be frozen there and not allowed to bob up in other labor disputes. Officials are tired of seeing stoppage after stoppage caused by the "union security" demand and are about convinced that the issue no longer can be handled in a case-to-case manner.

Defense officials realize that, in the steel industry particularly, production of an adequate tonnage is difficult enough without interference by labor disputes.

Materials shortages are causing increasing concern and the obtaining of sufficient supplies will require the utmost co-operation of all parties concerned.

"Less Than Month's Supply"

Most critical is that of scrap. Department of Commerce last week reported supplies have diminished to the point where new sources will have to be uncovered if steel production is to be continued at near-capacity levels. Scrap stocks at mills, the department found, average less than a month's supplies and consumption is steadily exceeding receipts.

To increase available supplies, the Department of Agriculture last week asked farmers to sell their scrap for defense uses and started to organize a campaign, state by state and county by county, for the collection of such metal. Institute of Scrap Iron and Steel Inc. is co-operating in the campaign and is making available freight tariffs and government-fixed price schedules to all county committees. The institute estimates "that at least 1,500,000 tons" can be obtained from farms.

Lessing J. Rosenwald, chief of the OPM Conservation Bureau, has started to organize a series of year-round campaigns to collect all critical metal scrap. The campaign will be directed through the commodity branches of OPM and will be continuous. This is interpreted to mean there will be no more such collection campaigns as the aluminum scrap campaign.

While coal reserves are dangerously low continued operation of the mines can provide sufficient supplies. Another strike, however, would be almost immediately reflected in steel mill operations.

Plate Producers and OPM Officials Discuss Deliveries

An indication of what may be expected at the steel conference in Washington this week was afforded by the meeting of plate producers with OPM officials last Thursday. The meeting was called by Mr. Whiteside, and practically all the platemakers in the country were present.

There was "all out" plain talk, and "plenty said on both sides." Government officials told the producers that they believed there is enough plate capacity in the country, but "deliveries have not been satisfactory."

Producers, on the other hand, told the officials that part of the trouble is due to the irrational way defense bodies, including Army, Navy and Maritime Commission, are placing orders.

The steel representatives stated that orders could be expedited if there was some simplification and standardization in placing them. As a result of the meeting "an effort will be made in this direction."

■ **Myron C. Taylor, left, former chairman of the United States Steel Corp., who arranged the truce under which the captive mines are now operating, and John L. Lewis, head of the United Mine Workers. NEA photo**

SWOC Bides Time Pending Outcome Of Captive Mine Negotiations

PITTSBURGH

■ A CALM like that of an armistice pervaded the labor front here last week. The Steel Workers' Organizing Committee withheld its fire while the captive coal mine negotiations were under way in Washington. The result of those deliberations is expected to have a deep influence on the course of labor and management for the duration of the war, and possibly longer.

One outcome rumored here is a compromise deal which would grant a closed shop in captive mines, providing the closed shop for the steel mills remain a dead issue for the balance of the emergency.

This seems unlikely in view of a statement made at midweek by David J. McDonald, international secretary-treasurer of the Steel Workers' committee. He declared that SWOC will press for union shop clauses "in the current negotiations" with Bethlehem Steel Co., Inland Steel Co., Youngstown Sheet & Tube Co., and Republic Steel Corp. He said publicly: "We believe we are entitled to that concession. The Steel Workers' union has established itself as a responsible American institution and its record of splendid co-operation with the employers in the iron and steel industry is a matter of common knowledge."

McDonald added that SWOC "intends to resist the forces of another depression after the war." This will be done, he stated, "by employing all the economic power of the union to prevent any wage cuts after the defense job is done."

Steelworkers last week had lost about 200,000 man-hours of labor because two unnecessary strikes, one the illegal walkout at Homestead structural mill and the other a dues-picketing drive at Irvin works, both units of Carnegie-Illinois Steel Corp. The Homestead stoppage, as reported in STEEL, Nov.

3, p. 31, was caused by a walkout of cranemen who demanded higher wages, in violation of the union contract. About 3000 men were idle as a result, and 16 open hearths were forced down. At Irvin, Paul Fasser, SWOC field man in charge of that plant, claimed 3300 of the 4200 employes there were members of the union, and that the dues drives would be continued until membership there reached 100 per cent. In other words, output of this plant will continue to be crippled, until some time to be determined by the local union officers.

One other strike was of more than passing interest here. Officers of the river transportation service of Carnegie-Illinois Steel Corp. held a 3-day "holiday" while they attempted to gain recognition of an AFL union. The strike is not yet settled, although work was resumed pending a hearing before the National Labor Relations Board regarding certification of the union as bargaining agent for the officers. The boats haul 50,000 tons of coal daily to the coke plants of United States Steel subsidiaries here; consequently coal stocks were further reduced.

Independent Union Certified At Pressed Steel Car Co.

PITTSBURGH

More trouble at the plant of Pressed Steel Car Co. here was forecast as a result of an NLRB order holding an independent union, and not SWOC, should be certified as bargaining agent for all employes at the company's McKees Rocks, Pa., plant.

The plant, which has been working on defense orders including armor plate and bomb parts as well as railway cars, has been subject to two strikes by SWOC in the past few months despite the fact the Independent Union of Car and Foundry Workers had previously been certified by the board as bargaining agent.

SWOC officials contend the independent union no longer represents a majority of the employes. However, no evidence to support this

■ **William H. Davis, chairman of the mediation board, left, discusses the captive mine situation informally with Irving S. Olds, chairman of the board, United States Steel Corp. NEA photo**

■ **OPM Director General William S. Knudsen, left, chats with E. G. Grace, president, Bethlehem Steel Co., center, and Cyrus Ching, member of the mediation board, between sessions of the board's hearings on the captive coal mine dispute. NEA photo**

claim has been presented to the board.

Navy Asked To Fire Unionists Delinquent in Dues at Kearny

CIO officials last week demanded the Navy Department dismiss seven union members at the Federal Shipbuilding & Drydock Co. yards at Kearny, N. J., for nonpayment of union dues. Rear Admiral Harold G. Bowen referred the request to the National Defense Mediation Board.

The CIO thus posed the issue of maintenance of union membership to the government. Refusal of this demand by the United States Steel Corp., of which Federal is a subsidiary, caused the yards to be seized by the United States Navy.

September Steel Employment Recedes First Time in 17 Months

Steel employment during September averaged 652,000 persons, slightly below the August peak of 654,000, according to a survey by the American Iron and Steel Institute.

The September decline was the first in 17 months and primarily reflected the shifting of demand from certain highly finished products requiring a large amount of labor to relatively greater production of plates, shapes and other products needing less labor.

Except for August, September steel employment is the highest on record. In the 16 months in which steel employment increased steadily, 150,000 were added to the industry's payrolls.

September payrolls totaled $110,392,000, against $112,757,000 in August, a longer month. In September, 1940, payrolls were $82,068,000. May payrolls this year totaled $115,267,000.

Wage earners averaged 98.2 cents an hour in September, compared with 98.5 in August, and 85.4 cents in September, 1940.

Average hours worked per week was 37.8 in September, 37.2 in August, and 36.5 in September, 1940.

	Number of Employes	Total Payrolls (dollars)	Average Earnings Per Hour (cents)	Average Hours Per Week
1940				
Jan.	556,000	82,826,801	83.5	37.1
Feb.	538,000	70,846,559	83.4	34.1
March	514,000	68,767,962	83.6	32.3
April	503,000	67,724,000	83.6	33.4
May	510,000	75,184,000	85.1	35.7
June	535,000	77,388,000	85.9	35.9
July	549,000	82,215,000	85.6	36.5
August	560,000	83,837,000	85.1	36.7
Sept.	565,000	82,068,000	85.4	36.5
Oct.	568,000	90,768,000	85.6	39.4
Nov.	577,000	87,921,000	86.2	38.2
Dec.	585,000	91,233,000	86.5	37.6
1941				
Jan.	598,000	96,234,000	86.6	39.2
Feb.	603,000	89,586,000	86.9	39.4
March	613,000	98,025,000	87.7	38.5
April	621,000	108,557,000	97.1	39.4
May	632,000	115,267,000	98.1	39.7
June	638,000	110,504,000	99.2	38.2
July	648,000	114,059,000	99.1	37.8
Aug.	654,000	112,757,000	98.5	37.2
Sept.	652,000	110,392,000	98.2	37.8

Study Means To Increase Capacity of Existing Steel Facilities

■ While widely publicized expansions of plant capacity are still in project form, another form of expansion, unheralded but effective, quietly proceeds. Steel plant engineers and operators have been stepping up productive capacity of existing equipment—doing a better job with what they already have.

This activity was the subject of a meeting of the Pittsburgh Section, Association of Iron and Steel Engineers, in that city, Nov. 5, attended by 400 steel plant officials and engineers.

The program covered coke plants, blast furnaces, open hearths, bessemer and duplexing, and mill equipment. The speakers were (left to right) F. C. Swartz, open-hearth superintendent, Carnegie-Illinois Steel Corp., Youngstown, O.; L. E. Riddle, blast furnace superintendent, Carnegie-Illinois Steel Corp., Duquesne, Pa.; W. T. Brown, research engineer, Jones & Laughlin Steel Corp., Pittsburgh; L. P. Lias, plant metallurgist, Jones & Laughlin, Pittsburgh; and Joseph Malborn, United Engineering & Foundry Co., Pittsburgh.

October Pig Iron Production at New Peak; Daily Rate Down 0.47 Per Cent

■ PRODUCTION of coke pig iron and ferroalloys in the United States in October rose to an all-time high, totaling 4,855,746 net tons, and was up 134,409 tons or 2.8 per cent from September. Daily output, however, decreased slightly from the record rate in September. Total of stacks in blast at the month's end was down three, according to reports from operators of the nation's 230 potential coke blast furnaces.

Up 9.4 per cent from 4,437,725 tons produced in October, 1940, last month's total was almost 20 per cent greater than output in the month in 1939, 4,062,670 tons. It was nearly 50 per cent greater than total production in October, 1937, and was 20.9 per cent larger than total of 4,018,724 tons produced in the month in 1929, when 203 stacks were in blast.

Combined production in the first 10 months this year, 46,191,610 tons, was greater than in any corresponding period in the past, and was up 21.7 per cent from the first ten months in 1940, when the total was 37,954,156 tons. It was 71.6 per cent greater than in the same period in 1939, compared with 37,182,470 tons in the first ten months in 1937, and was 13.8 per cent up from 40,600,948 tons produced in the period in 1929.

Daily average in October, 156,637 tons, was 741 tons or 0.47 per cent less than 157,378 tons, the revised daily average for September. It was second highest on record, was up 9.4 per cent from 143,152 tons in October, 1940, and compared with 104,450 tons produced daily in the month in 1937. In October, 1929, daily average output was 129,637 tons.

Average daily production in the first ten months was 151,946 tons, more than 21 per cent greater than 124,849 tons in the period last year. It compared with 88,565 tons in the period in 1939, with 122,311 tons in the first ten months in 1937, and 133,556 tons in the 1929 period.

Operating rate in October, based on the revised capacity total, was 98.9 per cent. This compared with 99.3 per cent in September and 97.4 per cent in August. In October, 1940, rate was 94.2 per cent, 85.2 per cent in the month in 1939, and 68.4 per cent in October, 1937.

Merchant iron produced in the month, 635,071 tons, was 15 per cent of combined output. It compared with 15.5 per cent in September, 15.4 per cent in August, 15 per cent in July, 14.9 per cent in June and 15.8 per cent in October, 1940.

Stacks in blast at the end of the month totaled 216, down from 219 Sept. 30. In August, 215 were blowing, 212 in July, 211 in June, and 191 in April, the year's low. Total in October last year was 196, and 188 in the month in 1939, against 151 in the month in 1937 and 203 in October, 1929.

Two merchant stacks were taken out of blast in the month and none added. In the steelworks or non-merchant classification, one stack was blown in and two removed from blast. Stacks blown out in the month:

In Alabama: Pioneer No. 2, Republic Steel Corp. In Ohio: Toledo B, Interlake Iron Corp., down for relining. In Pennsylvania: Isabella No. 1, Carnegie-Illinois Steel Corp., and Palmerton No. 1, New Jersey Zinc Co.

Sparrows Point G, Bethlehem Steel Co., at Sparrows Point, Md., was blown in during the month. This is a new blast furnace, rated at 1000 tons daily capacity, and increases the number of stacks at the Sparrows Point works to seven. A similar furnace is reported near completion at Lackawanna, N. Y., also by Bethlehem.

Fourteen furnaces were out of blast Oct. 31. Several have been reported in process of rebuilding or relining, and are scheduled to be relighted soon. These include: One Detroit, National Steel Corp.; One Granite City, Koppers United Co.; Carrie No. 4, Carnegie-Illinois Steel Corp.; Brier Hill No. 2, Youngstown Sheet & Tube Co., and the four blown out last month.

Following furnaces have not yet been reported definitely in active process of rehabilitation: Two Joliet stacks, Carnegie-Illinois Steel Corp.; Delaware, Philadelphia Electric Co.; and Cumberland, Warner Iron Co.

PIG IRON STATISTICS

RATE OF FURNACE OPERATION
(Relation of Production to Capacity)

	1941[1]	1940[2]	1939[3]	1938[4]
Jan.	95.5	85.4	51.0	33.6
Feb.	95.3	75.0	53.5	33.8
March	96.3	69.5	56.1	34.2
April	91.8	68.9	49.8	33.4
May	94.1	74.2	40.2	29.4
June	95.7	83.6	51.4	25.5
July	97.0	86.1	55.0	28.2
Aug.	97.4	89.9	62.4	34.8
Sept.	99.3	91.5	69.7	40.5
Oct.	98.9	94.2	85.2	48.0
Nov.	....	96.4	90.3	55.0
Dec.	....	96.4	88.5	51.4

[1] First six months are based on capacity of 57,503,030 net tons, Dec. 31, 1940—last six months on capacity of 57,830,610 net tons, June 30, 1940; [2] capacity of 55,628,060 net tons, Dec. 31, 1939; [3] capacity of 56,222,790 net tons, Dec. 31, 1938; [4] capacity of 56,679,168 net tons, Dec. 31, 1937. Capacities by American Iron and Steel Institute.

MONTHLY IRON PRODUCTION
Net Tons

	1941	1940	1939
Jan.	4,666,233	4,024,556	2,436,474
Feb.	4,206,826	3,304,368	2,307,405
March	4,702,905	3,270,575	2,680,446
April	4,340,555	3,139,043	2,301,965
May	4,596,113	3,497,157	1,923,625
June	4,551,040	3,813,092	2,373,753
July	4,766,216	4,060,513	2,638,760
Aug.	4,784,639	4,234,576	2,979,774
Sept.	4,721,337	4,172,551	3,218,940
Oct.	4,855,746	4,437,725	4,062,670
Tot. 10 mo.	46,191,610	37,954,156	26,923,812
Nov.	.....	4,397,656	4,166,512
Dec.	.....	4,542,864	4,219,718
Total	.....	46,894,676	35,310,042

OCTOBER IRON PRODUCTION
Net Tons

	No. in blast last day of Oct.	Sept.	—Total Tonnages— Merchant	Non-merchant
Alabama	18	19	126,848	207,842
Illinois	20	20	128,091	361,305
Indiana	19	19	17,018	519,363
New York	15	15	60,506	269,905
Ohio	46	47	135,930	959,447
Penna.	71	73	132,840*	1,409,520*
Colorado	3	3		
Michigan	4	4		
Minnesota	2	2	13,918*	175,851*
Tennessee	3	3		
Utah	1	1		
Kentucky	2	2		
Maryland	7	6		
Mass.	1	1	19,920*	317,442
Virginia	1	1		
West Va.	3	3		
Total	216	219	635,071*	4,220,675*

*Includes ferromanganese and spiegeleisen.

AVERAGE DAILY PRODUCTION
Net Tons

	1941	1940	1939	1938
Jan.	150,524	129,825	78,596	52,201
Feb.	150,244	113,943	82,407	52,254
March	151,707	105,502	86,465	53,117
April	144,685	104,635	76,732	51,819
May	148,262	112,811	62,052	45,556
June	151,701	127,103	79,125	39,601
July	153,749	130,984	85,121	43,827
Aug.	154,343	136,599	96,122	54,031
Sept.	157,378	139,085	107,298	62,835
Oct.	156,637	143,152	131,053	74,697
Nov.	.....	146,589	138,883	85,369
Dec.	.....	146,544	136,119	79,943
Ave.	151,946	128,128	96,740	57,962

To Remove Two Edgar Thomson Blast Furnaces

■ Two blast furnaces at Edgar Thomson works, Carnegie-Illinois Steel Corp., Braddock, Pa., will shortly be removed, it was reported last week. The stacks had previously been mentioned in connection with United States Steel Corp.'s expansion plans in Western United States. Instead, new furnaces will

be constructed at Provo, Utah, by Columbia Steel Co., the corporation's western subsidiary, and the two Edgar Thomson units will remain in the East.

Edgar Thomson K will be dismantled and moved to the company's Mingo Junction, O., works, to replace No. 3 stack there. Latter is scheduled for dismantling at the close of the present run. J furnace will be dismantled piecemeal and used to repair other stacks.

Both are small units. Stack K, 97 feet high, has a 19¼-foot hearth and a bosh of 22½ feet, with rated annual capacity 88,000 gross tons. Stack J is smaller, 88 1/3 feet high, hearth 18 feet and bosh 22¼ feet, with capacity 71,000 gross tons.

Latter was last operated in April, 1938, last rebuilt in 1902 and last relined in 1928. K stack was rebuilt in 1937, but has been idle several years.

Ten Months' Ingot Output Beats Any Prior Full Year in Steel History

■ STEEL ingot production in October established a new high monthly record, with 7,242,683 net tons, 111,042 tons more than the prior high of 7,131,641 tons in March, this year, according to the American Iron and Steel Institute.

Output in the first ten months this year totaled 68,793,571 tons, which exceeds the tonnage of any complete calendar year in the past.

It is 1,811,909 tons larger than output in 10 months last year and 5,588,081 tons greater than production in all 1929.

The weekly operating rate in October was 1,634,917 tons, compared with 1,593,389 tons in September and 1,609,851 tons in the previous high month, March, 1941.

Percentage of capacity operated in October was 99, against 96.4 in September and 99.7 in March.

Additional capacity available now accounts for the percentage in October being lower, when the tonnage actually was larger than in March.

Steel Ingot Statistics

	Estimated Production—All Companies								Calculated weekly production, all companies	Number of weeks in month
	—Open Hearth—		—Bessemer—		—Electric—		—Total—			
	Net tons	Per cent of capacity	Net tons	Per cent of capacity	Net tons	Per cent of capacity	Net tons	Per cent of capacity	Net tons	
Based on Reports by Companies which in 1940 made 92.91% of the Open Hearth, 100% of the Bessemer and 85.82% of the Electric Ingot and Steel for Castings Production										
1941										
Jan. ..	6,276,429	99.1	451,637	76.0	200,019	91.0	6,928,085	96.9	1,563,902	4.43
Feb. ..	5,673,289	99.2	378,330	70.5	186,281	93.9	6,237,900	96.6	1,559,475	4.00
Mar. ..	6,461,936	102.0	460,169	77.4	209,536	95.4	7,131,641	99.7	1,609,851	4.43
1st quar	18,411,654	100.1	1,290,136	74.8	595,836	93.4	20,297,626	97.8	1,578,353	12.86
Apr. ..	6,135,941	100.0	395,009	68.6	225,999	106.2	6,756,949	97.6	1,575,046	4.29
May ..	6,365,172	100.5	444,361	74.8	243,705	110.9	7,053,238	98.7	1,592,153	4.43
June .	6,103,767	99.5	458,242	79.6	238,721	112.2	6,800,730	98.2	1,585,252	4.29
2nd qtr	18,604,880	100.0	1,297,612	74.3	708,425	109.8	20,610,917	98.2	1,584,237	13.01
1st half	37,016,534	100.1	2,587,748	74.5	1,304,261	101.6	40,908,543	98.0	1,581,312	25.87
July ..	6,089,859	96.6	489,239	85.0	242,584	87.4	6,821,682	93.4	1,543,367	4.42
Aug. .	6,243,100	96.6	495,523	85.9	262,334	94.4	7,000,957	95.7	1,580,351	4.43
Sept. .	6,058,731	97.0	500,687	89.8	260,288	96.9	6,819,706	96.4	1,593,389	4.28
3rd qtr	18,391,690	96.0	1,485,449	86.8	765,206	92.9	20,642,345	95.2	1,572,151	13.13
9 mos.	55,408,224	98.7	4,073,197	78.6	2,069,467	98.2	61,550,888	97.0	1,578,228	39.00
Oct. ..	6,427,977	99.4	532,862	92.3	281,843	101.4	7,242,683	99.0	1,634,917	4.44
Based on Reports by Companies which in 1940 made 98.43% of the Open Hearth, 100% of the Bessemer and 85.82% of the Electric Ingot and Steel for Castings Production										
1940										
Jan. ..	5,356,444	85.7	285,447	56.1	122,832	77.0	5,764,723	83.4	1,301,292	4.43
Feb. ..	4,208,249	72.1	205,458	43.2	112,090	75.2	4,525,797	70.0	1,093,188	4.14
Mar. ..	4,078,843	65.3	191,568	37.6	118,772	74.5	4,389,183	63.5	990,786	4.43
1st quar	13,643,536	74.4	682,473	45.7	353,694	75.6	14,679,703	72.3	1,129,208	13.00
Apr. ..	3,808,031	62.9	176,419	35.8	116,024	75.1	4,100,474	61.2	955,821	4.29
May ..	4,583,771	73.4	258,741	50.8	125,270	78.5	4,967,782	71.8	1,121,395	4.43
June .	5,222,120	86.3	305,115	61.9	130,208	84.3	5,657,443	84.5	1,318,751	4.29
2nd qtr.	13,613,922	74.2	740,275	49.5	371,502	79.3	14,725,699	72.5	1,131,875	13.01
1st half	27,257,458	74.3	1,422,748	47.6	725,196	77.4	29,405,402	72.4	1,130,542	26.01
July ..	5,269,701	84.5	322,567	63.5	132,357	83.2	5,724,625	83.0	1,295,164	4.42
Aug. ..	5,670,932	90.8	369,770	72.6	145,681	91.3	6,186,383	89.5	1,396,475	4.43
Sept. .	5,535,198	91.7	365,289	74.2	155,759	101.1	6,056,246	90.6	1,415,011	4.28
3rd qtr.	16,475,831	89.0	1,057,626	70.1	433,797	91.7	17,967,254	87.7	1,368,412	13.13
9 mos.	43,733,289	79.2	2,480,374	55.1	1,158,993	82.2	47,372,656	77.5	1,210,339	39.14
Oct. ..	6,059,792	97.0	408,317	80.2	176,433	110.6	6,644,542	96.1	1,499,897	4.43
Nov...	5,872,162	97.1	420,448	85.3	176,497	114.2	6,469,107	96.6	1,507,950	4.29
Dec. ..	5,907,840	94.8	399,434	78.6	188,083	118.2	6,495,357	94.1	1,469,538	4.42
4th qtr.	17,839,794	96.3	1,228,199	81.3	541,013	114.3	19,609,006	95.6	1,492,314	13.14
Total..	61,573,083	83.5	3,708,573	61.7	1,700,006	90.3	66,981,662	82.1	1,281,210	52.28

The percentages of capacity for 1940 are calculated on weekly capacities of 1,410,130 net tons open hearth, 114,956 net tons Bessemer and 36,011 net tons electric ingots and steel for castings, total 1,561,097 net tons; based on annual capacities as of Dec. 31, 1939 as follows: Open hearth 73,721,592 net tons. Bessemer 6,009,920 net tons, electric 1,882,630 net tons.

The percentages of capacity operated in the first six months of 1941 are calculated on weekly capacities of 1,430,102 net tons open hearth, 134,187 net tons bessemer and 49,603 net tons electric ingots and steel for castings, total 1,613,892 net tons; based on annual capacities as of Dec. 31, 1940 as follows: Open hearth 74,565,510 net tons, bessemer 6,996,520 net tons, electric 2,586,320 net tons. Beginning July 1, 1941, the percentages of capacity operated are calculated on weekly capacities of 1,459,132 net tons open hearth, 130,292 net tons bessemer and 62,761 net tons electric ingots and steel for castings, total 1,652,185 net tons; based on annual capacities as of June 30, 1941 as follows: Open hearth, 76,079,130 net tons, bessemer 6,793,400 net tons, electric 3,272,370 net tons.

Dealer Scrap Source for 27% of Steel in 1941

■ Twenty-seven per cent of all steel made in United States and Canada this year will have had its source in dealer scrap, it was stated last week by Edwin C. Barringer, executive secretary, Institute of Scrap Iron and Steel Inc., Washington, in addressing the annual convention of the Canadian Secondary Materials Association in Toronto.

Because substantial additional supplies of pig iron cannot be obtained until recently-launched blast furnace expansion programs are matured more than a year hence, he said, the scheduled increase in steel production in both nations can be achieved only if more scrap is brought to market. Prospect is that at least 33 per cent of all steel made in 1942 will be a transformation of waste metal.

Salvage Committee Is Formed in Connecticut

■ Waste material dealers of Connecticut, meeting in Hartford last week, endorsed creation of a state salvage committee to co-operate with the Connecticut Council of Defense when Bureau of Industrial Conservation of OPM launches a campaign in that state. Committee includes these groups:

Iron and steel scrap: Joseph A. Schiavone, Michaels Schiavone & Son Inc., New Haven; Nathan Katz, Jacob A. Katz & Sons Inc., Hartford; Samuel Jacobs, Jacobs Bros., Bridgeport; David Zusman, Commercial Iron & Metal Co., Waterbury.

Nonferrous scrap: Sam Suisman, Suisman & Blumenthal Inc., Hartford; George Kasden, H. Kasden & Sons Inc., New Haven; Jacob K. Luria, Kolman, Luria & Son, Ansonia; Abe Lapidus, Lapidus Metal Co., New Haven.

Secretary of the committee is Edward A. Suisman, Suisman & Blumenthal Inc., Hartford; advisor, Sam Hershman, I. Hershman & Co., New Haven.

J & L Offers Government 1500-Acre Plant Site

PITTSBURGH

■ Jones & Laughlin Steel Corp. has offered to turn over to the federal government a 1500-acre tract in Hammond, Ind., as a site for a steel works to be built by the government and operated by J & L.

This was disclosed by William J. Creighton, vice president, testifying in an injunction suit brought by minority stockholders opposing the corporation's recent merger with coal subsidiaries and change in capitalization.

The witness testified the offer was made after an invitation was extended by the Government seeking helpful suggestions for industry's expansion. Should such a plan go through, Jones & Laughlin would require a large amount of working capital to operate the proposed works.

The Hammond site near Chicago formerly was owned by the Newport Co., a Schlesinger interest. It then passed to Steel & Tubes and later to Youngstown Sheet & Tube. A ship canal connects the tract with Lake Michigan.

Republics' 107.2 Per Cent Sets Operating Records

■ Demands for steel for defense purposes have resulted in new production records by Republic Steel Corp., Cleveland, during the month of October. The new records exceed, in most cases, records made earlier in the year.

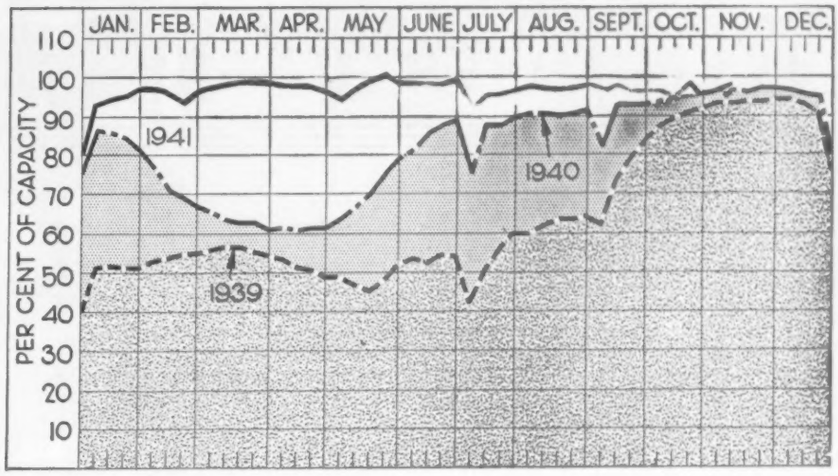
Among the corporation's records are the following: Pig iron, previous record, 447,713 tons; new record, 451,056 tons. Open hearth steel ingots, previous record, 721,243 tons; new record, 758,499 tons. Electric furnace steel ingots, previous record, 51,837 tons; new record, 58,668 tons. Bessemer ingots, previous high, 63,421 tons; new peak, 64,687 tons.

In addition to the corporation records, virtually every operating district and division broke production records.

During October, Republic operated at 107.2 per cent of capacity; and for the first nine months of 1941 operated at 99.4 per cent of capacity.

OPM May Recommend Inland Expansion Soon

■ OPM is reported about ready to recommend the expansion of the producing facilities of Inland Steel Co. to the Defense Plant Corp. While no official information is available, it is said that the increase will include what are termed scrambled facilities to increase the Inland capacity by some 720,000 ingot tons.



PRODUCTION . . . . Up

■ PRODUCTION of open-hearth, bessemer and electric furnace ingots last week increased 2 points to 97½ per cent of capacity. Three districts advanced, six declined and three were unchanged. A year ago the rate was 96½ per cent; two years ago it was 93 per cent.

Cincinnati — Open-hearth repair caused the rate to drop 4 points to 87½ per cent.

Chicago — Down 2½ points to 101 per cent. Labor and scrap shortages remain potential threats to continued production.

Detroit — Rose 4 points to 95 per cent, only one open hearth being down all week.

St. Louis — Restoration of three open hearths which had been shut down because of scrap scarcity raised the rate 15 points to 98 per cent.

New England—For the fifth week production held at 90 per cent.

Central eastern seaboard—Because of scrap shortage production last week receded 1 point to 91 per cent, with a further drop expected this week.

Cleveland — Removal of one open hearth lowered the rate 3 points to 94 per cent.

Pittsburgh — Advanced 9 points to 99 per cent, regaining the ground lost through the Homestead strike.

Wheeling — Unchanged at 95 per cent.

Buffalo — One open hearth has been shut down for repair, causing the rate to drop 2 points to 79 per cent.

Birmingham, Ala. — Steady at 95 per cent, with tight scrap situation still a threat.

Youngstown, O. — Declined 1 point to 97 per cent as Republic Steel Corp. took off two open hearths, one from lack of scrap and the other for repair, leaving 74 open hearths and three bessemers active. Further suspensions for lack of scrap seem imminent. The rate this week probably will be 1 point lower.

District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended Nov. 8	Change	Same week 1940	Same week 1939
Pittsburgh	99	+ 9	97	94
Chicago	101	− 2.5	97	91
Eastern Pa. ...	91	− 1	94	84
Youngstown ..	97	− 1	92	93
Wheeling	95	None	98.5	93
Cleveland	94	− 3	86.5	87.5
Buffalo	79	− 2	93	90
Birmingham ..	95	None	100	94
New England..	90	None	85	90
Cincinnati	87.5	− 4	94	87
St. Louis	98	+15	85	77
Detroit	95	+ 4	93	100
Average	97.5	+ 2	96.5	93

Carnegie-Illinois To Sell Idle Elwood, Ind., Plant

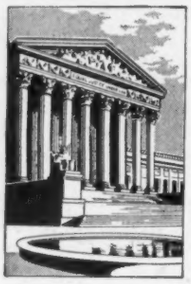
■ Negotiations were reported under way last week for sale of Carnegie-Illinois Steel Corp.'s American Works at Ellwood, Ind. A. Deitch Co., New Kensington, Pa., was said to be the prospective purchaser.

Comprising 33 acres, the plant was closed in 1933, when modern steel production methods rendered it obsolete. Executives of Carnegie-Illinois declared they did not know whether the plant would be reopened by the purchaser.

■ Thirteenth Annual Products Exposition, sponsored by the Chicago Purchasing Agents Association, and featuring "What Is New in Industry," will be held in Hotel Sherman, Nov. 12-13. Displays of new 1941 products will be exhibited by association members and Chicago Purchasor Advertisers.

Windows of *WASHINGTON*

Joint United States-Canadian board named to co-ordinate defense production facilities . . . Annual wage plan contained in wages and hours act . . . Simplification of varieties and styles of products of all industry requested by OPM Conservation Bureau . . . Metal office furniture production limited . . . discontinuance of WPA for duration of the emergency advocated by economy league



By L. M. LAMM
Washington Editor, STEEL

WASHINGTON

■ APPOINTMENT of a joint United States and Canadian defense production committee for the purpose of co-ordinating the capacities of the two countries was announced last week by the White House. Board was named after a conference between the President and Prime Minister Mackenzie King of Canada.

United States members are: Milo Perkins, executive director of the Economic Defense Board, chairman; E. R. Stettinius Jr., lend-lease administrator; W. H. Harrison, head of the OPM Production Division; James V. Forrestal, undersecretary, of the Navy; Robert P. Patterson, undersecretary of War; H. L. Vickery, vice chairman of the Maritime Commission.

Canadian members: G. K. Sheils, deputy minister of Munitions and Supply, chairman; J. R. Donald, director general of chemicals and explosives in the Canadian defense organization; H. J. Carmichael, director general of munitions production; R. P. Bell, director general of aircraft production; H. R. McMillan, president, War-Time Merchant Shipping Ltd.; Walter Gordon, department of finance.

Annual Wage Plan Amended In Fair Labor Standards Act

An amendment to the provision of the Fair Labor Standards Act of 1938 allowing an average 40-hour week for employes guaranteed an annual wage has been approved, Gen. Philip B. Fleming, administrator, has announced.

The provision amended limits hours on an annual rather than a weekly basis for those employed "in pursuance of an agreement . . . made as a result of collective bargaining by representatives of employes certified as bona fide by the National Labor Relations Board." Time and a half overtime need not go into effect for such employes until after 12 hours a day and 56 hours a week.

Amendment changes the annual limitation from 2000 hours as at present to 2080 hours. It provides an average work-week of 40 hours on an annual basis as compared with an average work-week of approximately 38½ hours under the schedule as originally enacted.

Use of Steel in Office Furniture Cut 40 Per Cent

Amount of steel that may be used in the manufacture of a wide variety of metal office furniture and equipment has been sharply curtailed by the Priorities Division.

Monthly over-all reduction during the period from Sept. 1 to Dec. 31, is approximately 40 per cent below the monthly average of steel used in the 12 months ended June 30, 1941. Between 70 and 75 manufacturers are affected.

Use of steel by the industry will be measured by the tonnage contained in the final products. This will prevent use of large amounts of cut steel now in inventory.

If the program were continued without revision for a year, it would release at least 100,000 tons of steel for vital national defense uses.

The industry is now consuming approximately 300,000 tons of steel a

Highspots in the Week's Washington News

Allocations system for all critical materials to be evolved by SPAB and OPM (p. 29).

Steel industry representatives meet with OPM officials this week to discuss ways and means to best utilize productive capacity (p. 31).

Used steel drum price ceiling soon to be established (p. 43).

Zinc alloys price maximums established (p. 43).

Copper restriction order eased to allow use to sheet, strip and screening in construction until Jan. 1 (p. 43).

Farm machinery rating plan extended to Nov. 30 (p. 43).

Aluminum scrap price schedule amended (p. 42).

Low-grade manganese and chrome ores to be purchased by Metals Reserve Co. (p. 42).

Cobalt placed under direct allocations system (p. 41).

Priorities to be explained by OPM in new series of booklets (p. 41).

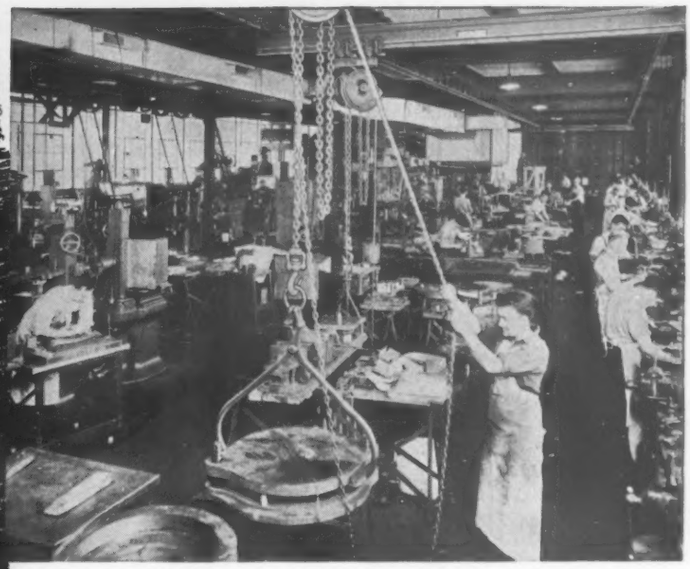
High-cost copper output of Michigan mines purchased by Treasury Department (p. 40).

OPA asks manufacturers of printing presses and equipment, glassmaking machinery, and copper wire and cable used to conduct electricity not to advance prices (p. 40).

Reduction in number of varieties and styles asked by OPM of all industries (p. 40).

Steel used in manufacture of metal office furniture limited (p. 39).

AMERICAN MONORAIL *Relieves* "PRODUCTION JITTERS"



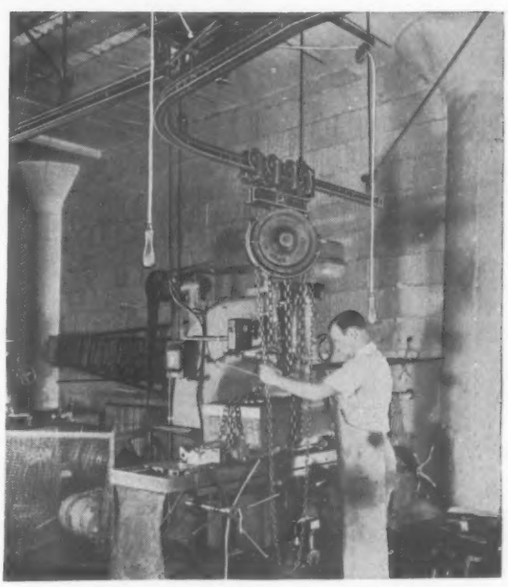
Fast moving cranes serve entire area in tool and die shop.

AMERICAN MONORAIL
OVERHEAD HANDLING EQUIPMENT

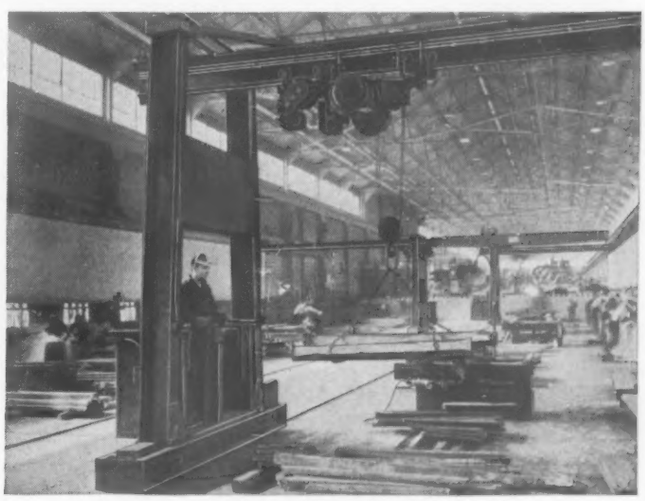
"HIGH re-handling costs through process"—"Production tied up by floor congestion" — "Too much handling by skilled labor" — these and many other "production jitters" are being easily and quickly "cured."

The American MonoRail Engineer has the right prescription for putting production on an efficient basis.

Whatever your handling problem may be, it will pay you to talk with an American MonoRail Engineer. He will explain the benefits of American MonoRail Overhead Handling Equipment particularly suited to your individual problem.

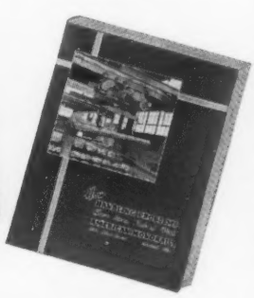


Spur track over milling machine helps operator set heavy die block.



Power operated gantry feeds billets to cleaners at snagging wheels.

Send for copy of Blue Book. See the American MonoRail Engineer Immediately. →



The American MonoRail Co.

13102 Athens Avenue · · Cleveland, Ohio

year. The amounts of labor and other resources used per ton of steel are very small, and it is felt that withdrawing a ton of steel from this industry will cause relatively less dislocation and displacement of labor than withdrawing a ton from other uses.

All Industries Asked To Reduce Varieties, Styles

Manufacturers in all fields have been requested to reduce the number of varieties and styles of their products by the OPM Bureau of Industrial Conservation.

Proposals by each industry for simplification programs will be welcomed, according to Lessing J. Rosenwald, chief of the bureau. Industries will not be expected to police such programs themselves, but will be asked to follow recommendations issued by the bureau.

Priorities Director Nelson estimates a widespread simplified practice program would increase the productive capacity of the country for defense from 25 to 33 1/3 per cent. In many instances, it was pointed out, a manufacturer or distributor does 80 per cent of his business on 20 per cent of the products handled. The other four-fifths of the varieties, providing only one-fifth of the business, add to the expense of the production and distribution, run up the inventory, slow down the turnover, tie up funds, and take up space.

OPA Asks Manufacturers To Hold Printing Machinery Prices

OPA has requested manufacturers of printing press and other printing machinery and glassmaking machinery not to advance prices above the level of July 29.

Action followed a series of meetings with manufacturers in each industry concerned at which recent price trends were discussed and methods of achieving price stability considered. The action, it was stated, is an interim measure designed to stabilize prices pending more detailed study. Similar requests already have been made to manufacturers of machine tools, agricultural machinery, chemical process machinery, mining and oil field equipment and the food and drug industries.

Copper Wire, Cable Producers Asked Not To Raise Prices

Manufacturers of copper wire and cable used to conduct electricity have been requested not to exceed their Oct. 15 prices by OPA.

This represents the first of a series of steps in OPA's recently announced program to stabilize prices of all products made of copper, brass, or other copper-base alloys. The program is made necessary by the serious copper shortage caused by heavy defense demands and by the OPM conservation order of Oct. 21 sharply restricting use of copper for many products.

OPA draws attention to the fact that the OPM conservation order excludes from its restrictions the use of copper and copper-base alloys in articles primarily employed as conductors of electricity, and adds: "We would hope . . . that the restriction of civilian demand and the assurance of copper supplies for your industry may bring about a situation that will permit of somewhat lower prices."

Conferences with representative members of the copper wire and cable industry will be called by OPA in the near future to discuss recent trends in costs and prices.

Treasury To Buy Output of High-Cost Copper Producers

Contracts for the entire output of three high-cost Michigan copper producers have been signed by the Treasury's Procurement Division. The companies are the Copper Range Co., Quincy Mining Co. and the Isle Royale Copper Co.

Contracts are for six months and call for the purchase of the mine output of these companies at maximum prices of 15 and 16 cents a pound, previously approved by OPA. Negotiations were conducted jointly by the OPM, OPA and the Procurement Division.

Under the plan the government will pay a price equivalent to the out-of-the-pocket cost to producers for the 6-month period ended June 30, adjusted to include a $1 a day wage increase for each 8-hour shift, plus other expenses incident to the increased wage, plus an additional cent per pound if total price is lower than production cost during the contract period.

If the out-of-the-pocket cost is low-

World Labor Leaders Hear About "Misguided Few"

■ Last week in his White House address before 250 delegates to the International Labor Organization Conference, President Roosevelt struck out against the "misguided few in industry and labor who deliberately delay defense output by using their 'economic power' to force acceptance of their demands . . ." He also referred to Berlin as the "principal slave market of the world."

This was one of the incidents in the day in which a billion dollar United States loan to Russia was announced by the State Department, and it was disclosed that Secretary Morgenthau proposed a 15 per cent tax on salaries with employers collecting for the government—as some of them now do for the unions.

Illustrated is a group of the "world labor leaders" at a luncheon and reception in New York. Left to right, Walter Schevenels, secretary, International Federation of Trade Unions; Joseph Kosina, representing Czechoslovakian trade unions; Matthew Woll, vice president, AFL, and chairman of the American Labor Committee To Aid British Labor; George Gibson, vice president, British Trade Union Congress; and Tom Lyons, vice president, AFL, and president, New York State Federation of Labor.

er during the contract period than adjusted production cost, price will be production cost plus 50 per cent of the difference between the periods, in no case to exceed the maximum provided in the contract.

OPM To Publish Series of Booklets Explaining Priorities

OPM soon will publish a series of booklets attempting to explain in readable form the priorities system pattern and the orders already issued. Defense officials decided on the step after being repeatedly confronted with confusion on the part of persons direcly affected by the priorities system.

OPM officials complain that many business men do not take the trouble to read the orders affecting them. They cite cases where business men have come to Washington and waited hours to see the proper person only to ask a question explained in the order involved.

OPM further will attempt to persuade industry to explain the priorities system to the public, whose understanding of the system is much more vague than that of business men.

Priorities Division officials first attempted to explain the system's workings by sending representatives to business conventions. However, the number of men reached was comparatively small, and the explanations often inadequate.

Federal Jobholders Increase 238,509 in Six Months

Additional employes in the executive branch of the federal government to the number of 238,509 were added between December, 1940, and June of this year, raising the total of such jobholders to 1,358,150.

The War and Navy Departments accounted for 75 per cent of the increase, or 137,475 employes.

Only notable decrease was in the Commerce Department where the census staff was decreased from 10,791 to 8256.

Urges Discontinuance of WPA for the "Duration"

Discontinuance of the Works Progress Administration for the duration of the emergency was advocated last week by the National Economy League. A study was made public by the league showing that only 59 cents of every dollar spent on WPA projects reached relief workers.

"Considerable savings in overhead costs could be made by abandoning work relief during the armament period and providing direct relief, as is necessary, through state and local welfare agencies. Federal grants may well be used in certain areas where state and local funds are inadequate."

The study warned that the ratio of overhead costs to the amount received by the relief workers would increase during the present fiscal year, as increased emphasis is placed on projects certified as being important to national defense.

Thirty thousand new public buildings and 600,000 miles of road construction and improvements have been listed among accomplishments of the WPA during the past six years by Howard O. Hunter, administrator, in summarizing the program.

An average of 2,130,000 persons have been employed over the six-year period. Present employment is 1,040,000.

Contributing to the defense program have been the improvement of 800 airports. New landing fields were built at 222 fields; 200 hangars and 700 other airport buildings were constructed.

Cobalt Placed Under Direct Allocations System

Because of a shortage and the uncertainty of shipments from abroad, cobalt has been placed under a direct allocations svstems.

General Preference Order M-39 places domestic and imported ore and concentrates, cobalt metal, and cobalt chemical compounds, under mandatory control and restricts deliveries and acceptances of cobalt for metallic uses to specific authorizations by the Priorities Division.

Order provides that monthly requests for cobalt shall be filed on forms prescribed by the division. Monthly allocations of cobalt for metallic purposes will be made by Director Nelson, and may be made without regard to previous preference ratings.

Deliveries of cobalt chemical compounds for nonmetallic uses by any processor or dealer are limited to 90 per cent of the average monthly weight delivered by him for the first six months of 1941. A similar restriction is placed on the manufacture of those chemicals which are not convertible into cobalt metal. Termination date of the order is March 31, 1942.

Fifteen hundred of the 1700 tons of cobalt now being produced annually in the United States come from ore imported from Africa. Domestic ore is limited to a small area in Pennsylvania where it is produced as an iron by-product. Canada produces some cobalt but all of it is being used for war purposes there and in England. Some low-grade ore deposits exist in Canada and could be placed in production as an emergency supply for the United States.

Facilities to increase metal refin-

Stainless Steel Saves Weight in Destroyer Stacks

Construction of weight-saving stainless steel funnels for new destroyers is explained to naval officers by Edward G. Budd, president, Budd Mfg. Co., Philadelphia. Stainless steel with its high strength and corrosive-resistant properties "makes possible a weight saving of 4½ tons per stack, or 18 tons for each four-stack vessel." Weight thus eliminated can be used to increase armor or armament. NEA photo

ing capacity by 50 per cent now are under construction at Niagara Falls, N. Y., and are expected to be in production by the middle of next summer.

Cobalt metal is used as an alloy for steel, largely in the production of high-speed cutting tools. Cobalt chemical compounds are used as a dryer for paint and as a binder for applying enamel to steel. Total estimated requirements for 1942 are approximately 400 tons more than current annual production in the United States.

Government To Buy Low-Grade Manganese, Chrome Ores

To stimulate domestic production of manganese and chrome, Metals Reserve Co. will consider contracts with producers for ores with a minimum content of 40 per cent manganese or 40 per cent chrome, Federal Loan Administrator Jones has announced.

Heretofore, Metals Reserve Co. has contracted for 1,900,000 tons of high-grade domestic manganese ore at a price on delivery to stockpiles which averages approximately 65 cents a unit. Also, the agency, in addition to contracting with producers, has already undertaken the production of 60,000 tons of domestic chrome concentrates yearly and expects to increase this to 120,000 tons.

Deliveries under manganese contracts now in effect are increasing and it is expected that present production of ferro-grade manganese ore will increase during the same period that the new production of lower grade ore will be brought in. Domestic chrome ores or concentrates produced to date have been required by industry and none, as yet, have been available for stockpiling.

Aluminum Scrap Price Schedule Amended

Formal amendment of Price Schedule No. 2, aluminum scrap and secondary ingot, incorporating previously announced reductions ranging from 1 to 3 cents a pound in ceiling prices and establishing specific premiums for scrap shipments in quantity has been issued by OPA.

Lowered ceiling prices follow a voluntary reduction of 2 cents a pound in the price of virgin aluminum, which became effective Oct. 1. Variations in the amount of the reductions in scrap and ingot prices re-

Priorities Specialists Attached to Defense Divisions

■ PRIORITIES specialists assigned to the various OPM divisions and branches and to other defense agencies are listed below. Room addresses are in the New Social Security building, Washington, unless otherwise noted. Several of the priorities specialists attached to the Division of Civilian Supply are located in the Temporary Building D, Independence avenue and Fourth street S.W., Washington, while those attached to the Office of Petroleum Co-ordinator are in the New Interior building. Division of Export Control specialist is located at 2501 Q street, N.W.

		Room
Samuel S. Stratton	Technical Consultant to the Director	5714
Spaulding Birss	Assistant to Technical Consultant	5714
Philip B. Hoppin	Assistant to Technical Consultant	5714

Division of Production

W. G. W. Glos	Head Priority Specialist	4309
C. Clay Crawford	Aircraft	4421
Walter C. Armstrong	Ordnance	4309
Allen B. Hood	Tanks and Combat Vehicles	1044
L. K. Vry	Tools	3340
W. C. Wetherill	Shipbuilding	4718
W. C. Wetherill	Construction	4718

Division of Purchases

J. Wilton Peters	Head Priority Specialist	2066
Charles Smith	Food Supply	2627
Walter P. McGowan	Textile, Clothing & Equipage	2062
Samuel A. Palmer		2064
George G. Orrick		2079
Raymond G. Daly		2062
J. Bedford French	Health Supplies & Fire Equipment	2605
Joseph H. DeVeau	Containers	2060
Charles Dailey		2727
L. Malcolm Slaght	Special Assignments	2058
Thomas F. Flaherty		2431
Robert A. Harris		2064

Division of Civilian Supply

John W. Harriman	Head Priority Specialist	Tempo D 2204
J. L. Ritchie	Pulp and Paper	4036
Francis E. Merrill	Printing and Publishing	4036
C. Henri Rush	Lumber and Building Materials	Tempo D 2238
Philip B. Hoppin	Plumbing and Heating	5714
John J. Moore Jr.	Electrical Appliances and Consumers' Durable Goods	Tempo D 2300
Fred Lavis Jr.	Automotive Transportation and Farm Equipment	2748
Austin Cunningham	Industrial & Office Machinery	Tempo D 2305
Edward L. Rinkenbach Jr		Tempo D 2305
Robert T. Williams	Rubber and Rubber Products	3360
Rex M. Beach	State & Local Government	Tempo D 2133

Division of Materials

H. K. McCook	Head Priority Specialist	3359
E. S. Ferguson	Aluminum & Magnesium	3305
D. P. Morgan	Chemicals	4062
Lucien Barnes		4062
E. Barrett Mason	Iron and Steel	2412
James G. Bowen		2412
W. J. Zepp	Power	2750
Francis W. Fitzpatrick		2742
Gaston F. Balme		2750
Fred L. Herron	Cork and Asbestos	3360
Stephen P. Dorsey	Nickel	3330
George H. Roll	Tungsten	5194
Paul T. Brady	Copper, Zinc	3359
George H. Roll	Manganese, Chrome	5194
George H. Roll	Tin, Lead	5194
George H. Roll	Mica, Graphite	5194
George H. Roll	Miscellaneous Minerals	5194

Office of Petroleum Co-ordinator

James E. Hughes	Head Priority Specialist	7514 New Interior
Robert K. Lyle	Petroleum	7514 New Interior

Division of Export Control

Stephen P. Dorsey	120, 2501 "Q" St., N.W.

flect the experience accumulated by OPA during several months of the schedule's operation as well as changes in market conditions since the schedule was originally announced on March 24.

By introducing quantity differentials on scrap, the amendment eliminates the distinction between "maker" and "dealer" maximum selling prices in the original schedule. The new set of scrap prices is applicable to sales by anyone whether maker or dealer, but the premiums for quantity shipments are designed to enable dealers to obtain a fair margin over their costs.

On deliveries of 1000 to 20,000 pounds by truck, or on deliveries of amount between 1000 pounds and the minimum carload lot, if shipped by rail, a premium of 1 cent a pound is allowed on all grades except old pistons and cast and forged scrap. For these latter types a premium of ½-cent a pound is provided.

For all types of scrap an additional ½-cent premium will be permitted on deliveries of over 20,000 pounds if shipped by truck within a three-day period, or on deliveries in minimum carload lots if shipped by rail. These premiums may be applied to a shipment made up of various grades of aluminum scrap. They are not applicable to shipments of aluminum mixed with other metals, except insofar as the segregated portion of the shipment qualifies by weight for the additional charge.

Farm Machinery Rating Plan Extended to Nov. 30

Provisions of the farm machinery and equipment rating plan have been extended until Nov. 30 by order of the Priorities Division.

The provisions, included in Preference Rating Order P-33 issued Aug. 20, assigned the highest civilian preference rating, B-1, to deliveries of materials to manufacturers needing them for production of new farm machinery.

Extension of the plan is necessary so that there will be no break in the continuity of the farm equipment program. Work is underway on a broader plan to make materials available for new machinery to carry out the Department of Agriculture's expanded 1942 food production program.

Another order grants an A-10 rating on deliveries of materials necessary for the production of parts for the repair and maintenance of existing farm equipment. This plan (P-32) expires Feb. 14, and is not affected by the extension of P-33.

Restrictions Eased on Use of Copper in Construction

Restriction against the use of copper sheet, strip and screen in building construction has been eased by the Priorities Division.

Restriction would have "frozen" stocks of already fabricated materials in the hands of manufacturers, distributors and consumers. Because of this, the restriction is revoked and copper sheet, strip and screening may be manufactured at a reduced rate and used until Jan. 1, after which their manufacture is prohibited under the general terms of Copper Conservation Order M-9-c.

Numerous other changes, largely for clarification, were made in the order by a series of amendments.

OPA Issues Maximum Prices for Zinc Alloys

List of maximum prices for zinc alloys, which OPA has prepared in light of the recent 1-cent a pound increase in the price of slab zinc, has been issued.

At the same time OPA announced that maximum prices on rolled zinc products, including sheet, strip, and plates, will be issued as soon as investigations now under way as to costs and earnings are completed.

The new prices on zinc alloys take into consideration the customary differentials between alloy and slab zinc. The new prices are considered adequate to assure present levels of production.

The OPA approved prices, applying to alloys made from high-grade zinc, are 11½ cents a pound for carload lots (i.e., any shipment taking a carload rate), 11¾ cents a pound for lots from 5 tons to a carload, and 12 cents a pound for less than 5-ton lots. These are delivered prices.

Ceiling prices on rolled zinc products will in all probability be lower than prices announced by certain companies following the recent advance in primary zinc prices.

Ceiling Prices for Used Steel Drums To Be Established

Schedule establishing ceiling prices on used steel drums substantially below present levels is being prepared by OPA and will be issued shortly.

New 55-gallon steel drums of standard construction sell for $2.72 each in the East. Recently the demand has been so great that prices of second-hand drums of this type have risen to nearly double the price for the new drum, according to OPA. The schedule will establish a more normal relation between price of the new and used product.

Ambassador "Perfectly Amazed"

■ **Declaring he was "perfectly amazed at the precision machining operations" he had inspected at the Packard Rolls-Royce engine plant in Detroit, Lord Halifax, British ambassador to the United States, spent two days last week touring a number of Detroit defense industries. Here he is shown with M. M. Gilman (left), Packard president, and Col. J. G. Vincent (right), Packard vice president in charge of engineering. Speaking of war materials generally, the ambassador said that whereas once the British had to "fit their plans to the stuff available", now supplies are building up to the point where they can be adapted to nearly any contingency and on any front**

Operating savings obtained from high steam temperatures and pressures would justify using expensive steels to avoid steam line trouble. Fortunately, an inexpensive Carbon-Molybdenum (0.50% Mo) steel does the job.

Its creep strength up to 1000° F, plus its easy weldability, make for light, leak-proof lines. The use of thinner sections sometimes reduces the already small cost differential over unalloyed steels.

Write for technical book, "Molybdenum in Steel".

CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.
MOLYBDIC OXIDE—BRIQUETTED OR CANNED • FERROMOLYBDENUM • CALCIUM MOLYBDATE

Climax Mo-lyb-den-um Company
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MOLY

Mirrors of *MOTORDOM*

Shell manufacturers will need months to install heat treating furnaces required by shift from high-manganese steel to new specification. Meanwhile yield strengths are improved by higher-carbon steel and forced cooling after forging . . . Preparing bids for 80,000,000 incendiary bombs of new type . . . Sixty-five millions allotted for new tank plants and machinery . . . Third-quarter reports choice news for tax collectors

By A. H. ALLEN
Detroit Editor, STEEL

DETROIT

■ FURTHER details have come to light on the impending change in specifications for steel to be used in production of rifled-bore shells, indicating major repercussions in many sections of the steel and metalworking industries. While producers of these large shells, 3-inch and upward, are relatively few, the forthcoming changes will throw a heavy burden on them in realigning equipment, as well as on steel companies in furnishing new analyses, and on builders of heat treating furnaces, quenching equipment and accessories.

As explained briefly here several weeks ago, what is being done is to shift from the present type of steel —a high-manganese steel of the S.A.E. X1335 type—to a steel with maximum manganese content of 1.00 per cent, carbon 0.55 per cent and sulphur either 0.06 maximum or in the range 0.06-0.12 per cent. Concurrently physicals of the finished shell are being increased from the present 40,000 p.s.i. minimum yield point to 65,000 p.s.i. minimum yield strength, indicating heat treatment is essential.

Date of Change Postponed

Principal reason assigned to the change is conservation of manganese, although naturally the higher physicals are of importance. But the sudden burden thrown upon suppliers of heat treating equipment is of such magnitude that there has had to be some postponement of the effective date of the change. At first it was believed that a complete switch could be effected by Dec. 15. This has proved impossible and ordnance officials are now sighting on next spring as the probable time when all shell producers will be equipped for the heat treating work.

Meanwhile, changes are being effected with present facilities to improve yield strengths of shell. By changing to a 1345 instead of a 1335 steel and using an air blast to cool the hot shell after forging, yield strength of 90-millimeter shell has been pushed up to around 60,000 p.s.i. This is a rather high figure for this steel and it is believed that not all shell plants can realize it. Where heating for forging is done by means of induction heating, keeping grain size small by the speed of heating, the matter of improving physicals is not so difficult.

Incidentally, the yield strength as defined in new specifications for shell is not the same as the so-called beam drop yield point. The "yield strength" is measured by means of the extensometer and is defined as that strength at which the extensometer reading with the specimen under load of 65,000 p.s.i. does not exceed a specified arbitrary figure. Beam drop yield point is somewhat higher.

For 90 and 105-millimeter shell, it appears that a steel with carbon 0.35-0.38 and manganese 0.80 per cent minimum, resulphurized for free machining, will be suitable for the heat treated product. This would correspond to an S.A.E. X1040 with manganese controlled to 0.80-1.00 per cent, a steel not now produced in commercial tonnages, but readily adaptable to such production. Heat treatment will involve quenching in oil from 1650 degrees Fahr. and drawing at 750 degrees minimum, this process probably being carried out between rough and finish machining. Lower manganese content suggests better machinability over the present X1345, but this will be offset by reduction of sulphur limits.

Large producers of shell, like Olds at Lansing and Budd here in Detroit, are preparing for the changeover and are taking figures on heat treating equipment which, incidentally, will be paid for by the government. Extent of heat treating facilities can be appreciated from the fact that Budd will need furnaces and quenching equipment for handling about 7000 pounds of steel an hour.

Some extensive retooling for production of larger sizes of rifled-bore shell apparently is in the offing as well, in view of the expressed opinions of ordnance officials that the 3-inch (75-millimeter) antiaircraft shell is too small for satisfactory service in this country's operations. The 75's are still being made in large quantities (Budd recently received an order for 225,000) but it is believed most of them are being shipped overseas and that for equipment of the U. S. services the 90-millimeter and 105-millimeter sizes are now preferred.

Olds officials in Lansing are reported to have told the trade that their orders for 75's would be filled some time in December and that no new orders for this size are being received. This suggests retooling for larger sizes may be in prospect.

24 Plants To Handle Prime Contracts on Incendiaries

Classified in the "terrific" category is an order about to be placed by the ordnance department for 80,000,000 incendiary bombs of a new type. Slated to be issued formally around Nov. 15, the order will be apportioned among a couple dozen primary contractors throughout the country who must subcontract 60 per cent of the job. Eight of the primary contractors are in the Detroit district and are already taking figures on various phases of the assembly for preparation of bids.

The bomb is about 27 inches long and comprises a hexagonal-shaped steel tube with aluminum die cast fuse and detonator sections. Finished weight is around 5 pounds and the bomb is said to be designed so that upon contact with the objective it will spray a circle of fiercely burning magnesium powder 12 feet in diameter, after which the casing blows up. Some sort of porting arrangement is made to permit the

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burning charge to escape from the steel tube.

The bomb is estimated to have an overall cost of around $1.50, which would mean expenditure of something like $120,000,000 for the full contract. Three large die casting companies are already at work on multiple-cavity dies for the aluminum die castings in the assembly. Where the vast poundage of magnesium powder to charge such an array of bombs is going to come from is not immediately apparent, although perhaps the new West Coast magnesium plants now in the early stages of construction will figure prominently.

Ford Planning To Build One Medium Tank Per Hour

First formal word on new tank production in the Detroit district came last week from General Motors in a brief statement that the Defense Plant Corp. had allotted $25,783,000 to Fisher Body division for plant, facilities and equipment. A new building, with 500,000 square feet of floor space will be erected in the Flint, Mich., area for final assembly of both medium and heavy tanks. Buick and Fisher No. 1 plants will furnish subassemblies, with 15,000 men eventually to be employed on the project. Eighty per cent of the original allotment covers machinery and equipment for the plant. Last week machine tool representatives in Detroit said they had received no prints or requests for figuring on machinery for the GM tank project, although they were figuring on equipment for the Ford tank plant.

Letter of intent has been sent to Ford Motor Co. outlining a $39,000,000 expenditure for plant and equipment to produce tanks in the Ford Rouge and Highland Park plants, the bulk of this sum likewise to be apportioned to machinery needs. Figuring is now on the basis of one 28-ton tank an hour or 16 per day. The "B" building at the Rouge plant will be the center of much of the tank production activity. Meanwhile proposals are active to increase production of M-3 tanks at the Chrysler arsenal from 400 a month to 1500 a month. Additional equipment will be needed.

How soon any finished tanks will be rolling from Ford or GM lines cannot be stated definitely, but a good guess would be nine months at Ford and a year at GM.

Ford Motor of Canada in Windsor, Ont., is producing motorized equipment for British armies overseas at a clip of 200 units a day, and recently shipped the 100,000th "fighting machine" from this plant. Statisticians point out that the plant uses five tons of nails—100 kegs weighing 100 pounds each—every day in crating military vehicles for shipment abroad, and this year will use better than 60,000,000 board feet of lumber for packing cases.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1939	1940	1941
Jan.	356,962	449,492	524,058
Feb.	317,520	422,225	509,326
March	389,499	440,232	533,849
April	354,266	452,433	489,854
May	313,248	412,492	545,355
June	324,253	362,566	546,278
July	218,600	246,171	468,895
Aug.	103,343	89,866	164,792
Sept.	192,679	284,583	248,751
9 mos.	2,570,370	3,160,060	4,031,191
Oct.	324,689	514,374	.....
Nov.	368,541	510,973	.....
Dec.	469,118	506,931	.....
Year	3,732,718	4,692,338	.....

Estimated by Ward's Reports

Week ended:	1941	1940†
Oct. 11	79,065	107,957
Oct. 18	85,600	114,672
Oct. 25	91,855	117,080
Nov. 1	92,879	118,092
Nov. 8	93,585	120,948

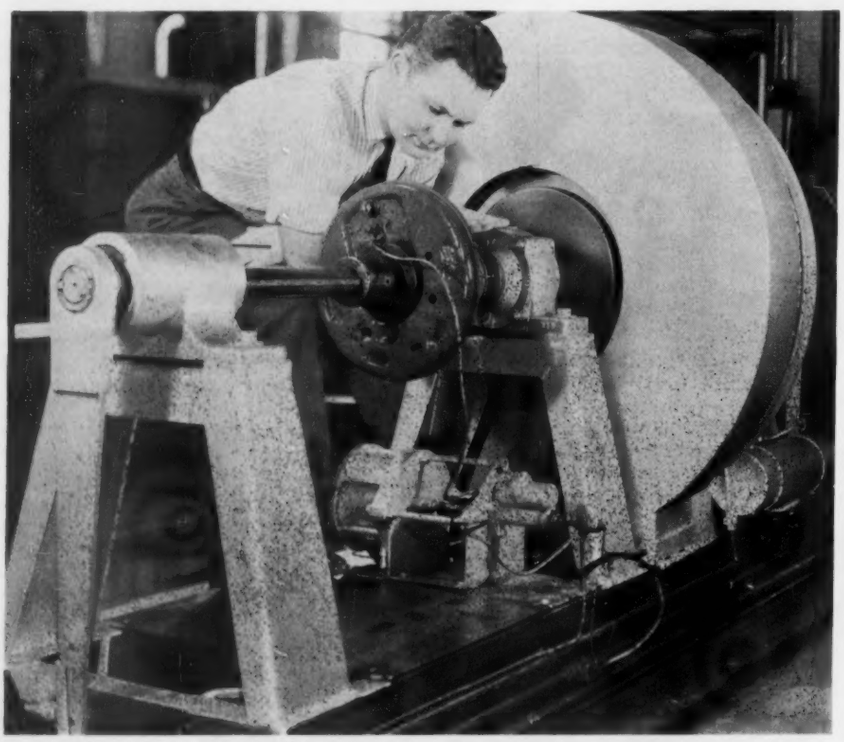
†Comparable week.

Provisions for Taxes Whittle Earnings Statements

Studebaker Corp. has regained much of the financial ground lost in the past decade, the third-quarter financial report showing consolidated net profit of $702,305, against net loss in the same period last year of $499,814. For the first nine months of the year profit exceeded $2,000,000, comparing with $457,495 last year. Net working capital, at $15,437,296, is the highest reported since the present corporation was organized, and is over five million dollars beyond the figure reported a year ago.

Outlook is good in the face of heavy orders for army and commercial trucks, production of which may offset curtailment of passenger car output. Meanwhile $50,000,000 worth of new plants is being hurried to completion so that a start can be made on initial orders of $74,000,000 worth of Wright airplane engines. Unfortunate delay in this engine project came about through a last-minute change in the size of the engine to be built, but this hurdle has been cleared by now.

Mr. Sloan of General Motors sums up the first nine months operations of his corporation by noting that sales were up 52.1 per cent from the same period a year ago; net income before taxes up 102.1 per cent; provision for taxes up 292.6 per cent and net income available for dividends up 24.8 per cent.

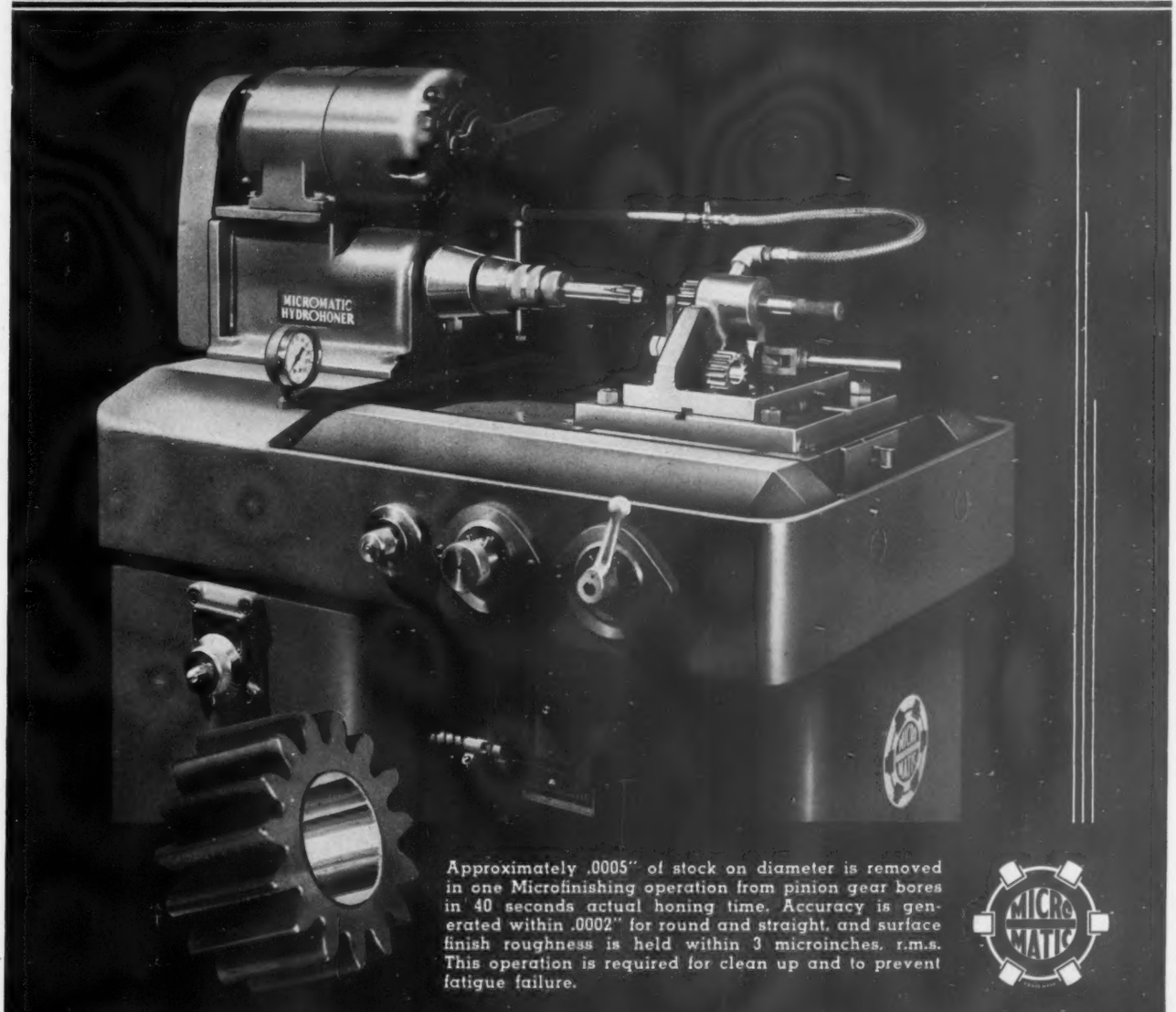


■ **BRAKE TEST: Buick engineers have devised this machine to wear-test brake drums and shoes. Joseph A. Psenka, assistant supervisor of dynamometer tests, is shown watching the results of a test in which the 600-pound flywheel is turned over at the rate of 1500 R.P.M. A pressure of 2000 pounds is used to halt the tremendous force. These figures represent far greater tests than imposed on the drums and shoes under driving conditions**

Step up production with the QUICKER, BETTER, LOWER COST METHOD

HONED MICROFINISH

REG. U.S. PAT. OFF.



Approximately .0005" of stock on diameter is removed in one Microfinishing operation from pinion gear bores in 40 seconds actual honing time. Accuracy is generated within .0002" for round and straight, and surface finish roughness is held within 3 microinches, r.m.s. This operation is required for clean up and to prevent fatigue failure.

MICRO MATIC

MICROMATIC HONE CORPORATION

1345 E. MILWAUKEE AVE., DETROIT, MICHIGAN

MEN of INDUSTRY

■ **FAY ALLER** has been named director of research, and **Albert Wartinger** has been appointed chief engineer, Sheffield Corp., Dayton, O. Mr. Aller, formerly chief engineer, Gage & Machine Tool Division, has been with the company eight years, while Mr. Wartinger, heretofore chief engineer, Tool & Die Division, has been with Sheffield 15 years.

♦

C. H. Black, vice president in charge of sales, American Can Co., New York, has been elected a director.

♦

V. T. Renner has resigned as manager of sales, Sheet Division, Parkersburg Iron & Steel Co., Parkersburg, W. Va.

♦

W. J. Sampson Jr. has been appointed general manager of sales, Steel & Tubes Division, Republic Steel Corp., Cleveland. He succeeds **L. W. Harston,** resigned.

♦

C. J. Sherlock, state highway director of Alabama, has been nominated as president of the American Road Builders' Association, Washington.

♦

Bruce Scrimgeour, formerly general manager, Consolidated Shipbuilding Co., New York, has been appointed general manager, Niagara Shipbuilding Co., Buffalo.

♦

Earl C. Warren, assistant general freight agent in Minneapolis, for the Great Northern railroad, has been named assistant general freight agent, with headquarters in Chicago, to succeed **Thomas J. Shea,** retired.

♦

Harry Ensminger has been placed in charge of the newly established New York office of Cardox Corp., Chicago, which will serve New England, eastern New York and New Jersey.

♦

E. C. Bolton, associated with Cutler-Hammer Inc., Milwaukee, 19 years, has been appointed manager of the Cincinnati district sales office. The past 16 years he has been located at Chicago.

♦

Joseph Q. Mecum, assistant works auditor since 1939, Gary, Ind., works, Carnegie-Illinois Steel Corp., has been made works auditor, to succeed **A. M. Roberts,** retired. **Myron W. Kreuger,** assistant works auditor, has become senior assistant works auditor. **Ernest R. Oliver,** assistant local auditor the past 13 years, has been appointed assistant works auditor; and **Arthur E. Dieckmann** has been made assistant to works auditor.

Fay Aller

Albert Wartinger

♦

John P. Ramsey has been appointed factory sales representative in New York and New England for Flexible Steel Lacing Co., Chicago. He succeeds **H. Irwin Reinhorn,** who is now associated with Ton-Tex Corp., New York. Mr. Ramsey's home is in New Canaan, Conn.

♦

John C. Phelan, Benjamin Eastwood Co., Paterson, N. J., has been re-elected president, New Jersey Foundrymen's Association. All other officers were re-elected, including **A. E. Winstead,** Moore Bros. Co., Elizabeth, N. J., as vice president; **A. J. Williamson,** Isbell-Porter Co., Newark, N. J., as treasurer, and **John L. Carter** as secretary.

♦

E. M. May, manager, Combustioneer division, Steel Products Engineering Co., Chicago, has been elected president, Midwest Stoker Association, to succeed **Mount Burns,** resigned. Mr. Burns has severed his connection with the stoker division, Link-Belt Co., of which he had been manager of retail sales, Chicago area. **J. J. Hays,** manager, Auburn Stoker Co., Chicago, replaces Mr. May as vice president of the association.

♦

Robert M. Gibson has been transferred from the Bartlett Hayward Division of Koppers Co. to the American Hammered Piston Ring Division at Baltimore, as engineer. Associated with Koppers 18 years, he formerly was assistant district engineer at New York and later assistant superintendent of maintenance, Seaboard Division. Since 1937 he was sales engineer of equipment for blast furnace, steel plant and process industries, Bartlett Hayward division.

♦

J. E. Strachan Jr., heretofore salesman in the Cincinnati territory for Norton Co., Worcester, Mass., has been assigned to the Pacific Northwest area which includes Washington, Oregon, Idaho, Montana and Wyoming. He replaces **A. M. Pitts,** resigned. **S. F. Prescott,** of the Worcester sales engineering department, becomes salesman at Cincinnati. **J. P. Enright,** formerly a member of the Chicago office staff, becomes field engineer in the Chicago district, while **Wendell C. Forsman** has been transferred from Worcester to Detroit, as field engineer.

♦

Raymond B. Battey, assistant general freight traffic manager, Chicago, Burlington & Quincy railroad, Chicago, has been named general freight traffic manager, succeeding **Lewis C. Mahoney,** retired. **G. R. Glover,** general freight agent, Denver, has been appointed assistant general freight traffic manager, with

headquarters in Chicago; **L. R. Schramm,** general agent, Philadelphia, succeeds Mr. Glover in Denver, and **E. O. Choice,** commercial agent in New York, succeeds Mr. Schramm in Philadelphia.

♦

Robert Grant has joined Young Radiator Co., Racine, Wis., in a production and managerial capacity. Educated at Cornell University, and a member of the Society of Automotive Engineers, Mr. Grant received his early production training as a line superintendent for the Nash Motors Division of Nash-Kelvinator Corp., Kenosha and Racine, Wis., and more recently as executive vice president, Fuller-Johnson Corp., Detroit, and its subsidiaries.

George J. Haislmaier has been named sales manager, Contract Products Division of Young Radiator. Associated with the company since 1936, Mr. Haislmaier formerly had been assistant sales manager and government specification engineer of the contract division.

Gifford K. Simonds Jr.
Whose appointment as general manager of Simonds Saw & Steel Co., Fitchburg, Mass., was announced in STEEL, Sept. 22, p. 28

J. J. Hilt, who has been serving as contract division sales manager, in addition to his duties as vice president, will devote his time to further development and co-ordination of contract work for military and defense needs.

♦

Raymond C. McKinney has been appointed superintendent, aircraft bearing division, Cleveland Graphite Bronze Co., Cleveland. He formerly was associated with the Pratt & Whitney Aircraft division of United Aircraft Corp., East Hartford, Conn., 14 years.

♦

Frank W. Rowe, for 23 years general purchasing agent, Johns-Manville Corp., New York, has retired. Mr. Rowe, who is 72, is among the first to retire under the company's new retirement plan. He joined the company in 1914 after serving as a purchasing agent for General Electric Co. He was an organizer of the Purchasing Agents Association of New York and a regional vice president, National Association of Purchasing Agents.

Daniel Simonds
Who has been elected president and chairman of the board, Simonds Saw & Steel Co., Fitchburg, Mass., as noted in STEEL, Sept. 22, p. 28

♦

Wallace F. Ardussi has been placed in charge of research and product development, Foote Bros. Gear & Machine Corp., Chicago. He graduated from University of Michigan in 1928, and has been associated with the automotive industry.

♦

B. H. Jones, formerly assistant sales manager, National Screw & Mfg. Co., Cleveland, has been made assistant vice president. **L. H. Norton** has been named assistant controller, and **S. M. Washabaugh** has been promoted from the sales department to manager of the order and production department.

D. J. Shelton
Who has been elected president and general manager, Marion Steam Shovel Co., Marion, O., as announced in STEEL, Oct. 27, p. 41

MEETINGS

Array of Speakers for New England Conference

■ SIX New England governors and 28 other leaders in industry, recreation, agriculture and government will address the seventeenth New England Conference, Hotel Statler, Boston, Nov. 13-14.

D. M. Nelson, executive director of SPAB and priorities director of OPM, will deliver the keynote at the governor's session, Thursday. Featured at the general session that evening will be Senator H. S. Bridges, New Hampshire, and H. W. Flannery, former Berlin correspondent for the Columbia Broadcasting System. The conference will conclude with an address, "An Editor Views the National Scene," by H. R. Luce.

Convention Calendar

Nov. 12-13—National Founders Association. Forty-fifth annual meeting at Waldorf Astoria hotel, New York. J. M. Taylor, 120 S. LaSalle street, Chicago, is secretary-treasurer.

Nov. 13-14—Society of Automotive Engineers, Inc. National transportation and maintenance meeting, Hotel Statler, Cleveland. John A. C. Warner, 29 West thirty-ninth street, New York, is secretary.

Nov. 14—Eastern Car Foreman's Association. Meeting at 502 Engineering Society building, 29 W. 39th street, New York. W. P. Dizard, same address, is secretary.

Nov. 18-19—American Management Association. Production division conference, William Penn hotel, Pittsburgh. H. J. Howlett, 330 W. 42nd street, New York, is secretary.

Dec. 1-5—National Association of Manufacturers. Annual meeting and congress of American industry at Waldorf-Astoria hotel, New York. Noel Sargent, 14 W. 49th street, New York, is secretary.

Dec. 1-5—American Society of Mechanical Engineers. Annual meeting, Waldorf-Astoria hotel, New York. C. E. Davies, 29 W. 39th street, New York, is secretary.

Galvanizers Place Two Members on Board

■ The governing board of the Galvanizers Committee announces the election of B. P. Finkbone, American Rolling Mill Co., Middletown, O., and D. A. Russell, Youngstown Sheet & Tube Co., Youngstown, O., to serve as members of the governing board for a 3-year term.

Other members of the board are: N. E. Cook, Wheeling Steel Corp., Wheeling, W. Va., chairman; C. K. Lytle, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.; W. R. Shimer, Bethlehem Steel Co., Bethlehem, Pa.; J. J. Shuman, Jones & Laughlin Steel Corp., Pittsburgh; and C. H. Steele, Steel Co. of Canada Ltd., Hamilton, Ont.

Activities of Steel Users, Makers

■ GREAT LAKES Carbon Corp., with offices at New York, Niagara Falls, N. Y., and Los Angeles, will build a calcined carbon plant at 114th street and Calumet river, Chicago. Plant will occupy a 7-acre area on an 18-acre tract purchased from Calumet Western Railway Co. and will cost about $500,000.

♦

Detroit Power Screwdriver Co., Detroit, has moved to larger quarters at 2801 West Fort street.

♦

Ampco Metal Inc., Milwaukee, has completed its North foundry, bringing total floor space of all its foundries to 144,000 square feet.

♦

Pennsylvania Transformer Co., Pittsburgh, has moved its general offices from 1701 Island avenue, to larger quarters at 808 Ridge avenue.

♦

California Cold Rolled Steel Corp. has moved into its new plant at 7140 Anaheim-Telegraph road, Montebello, Calif.

♦

Pittsburgh Tube Co., Pittsburgh, has appointed Standard Tube Sales Corp., New York, eastern representative for its welded mechanical tubing.

♦

Cooper Alloy Foundry Co., Elizabeth, N. J., will soon move to Hillside, N. J., where it acquired a 15-acre site and is completing a new foundry, to be in operation about Dec. 1.

♦

Western Electric Co., which operates a large plant at Kearny, N. J., employing more than 20,000 persons, has leased, by way of further expansion, a factory building on Avenue A, between Thirty-first and Thirty-second streets, Bayonne, N. J., providing 95,000 square feet of floor space.

♦

International Resistance Co., Philadelphia, has added approximately 30 per cent more manufacturing space to its plant, to meet expanded defense requirements. This is the third expansion in five years and a total increase of 50 per cent in floor space.

♦

Administrative departments of the Westinghouse X-ray division will be moved from Long Island City, N. Y., to Westinghouse Electric & Mfg. Co.'s radio division plant in Baltimore, about Jan. 1. Consolidation of the X-ray and radio divisions will speed defense work and permit office space in the Long Island City plant to become manufacturing shops for Army and Navy equipment.

♦

Acme Electric Welder Co., Los Angeles, has completed a new steel and brick factory comprising 18,000 square feet floor area and has installed machinery to permit straight line production of electric spot welders. The new unit is said to more than double the company's production, much of which is for defense.

♦

Carboloy Co. Inc., Detroit, reports production of carbide tools designed for cutting steel in the first nine months this year was 522 per cent over output in the comparable 1940 period. Total carbide production increased 278 per cent.

♦

Taylor-Winfield Corp., Warren, O., has requested the Warren city council to amend zoning regulations to permit the company to enlarge its plant. Company recently received a $500,000 national defense order.

♦

Perfect Circle Co., Hagerstown, Ind., has completed its fourth consecutive year without a lost-time accident at its Tipton, Ind., plant, and a full year (ended June 30) without a lost-time accident at the Hagerstown plant. At the latter, company is credited with 1,609,107 man-hours during the year.

♦

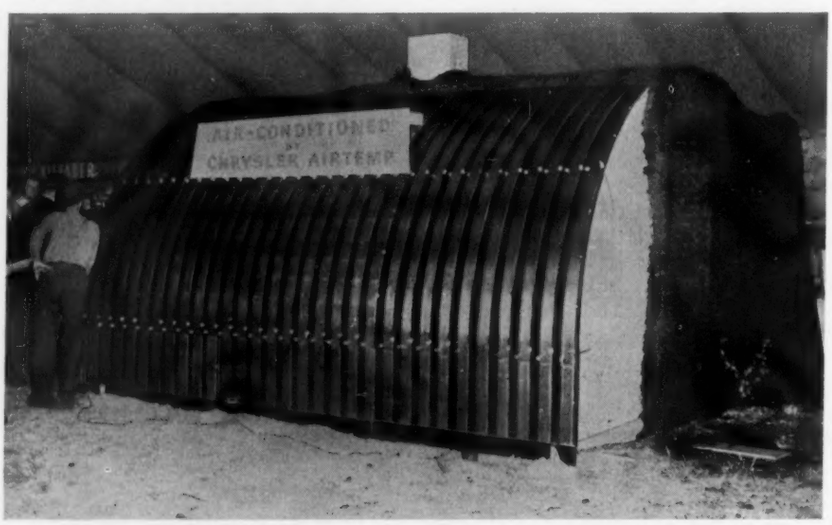
"The Inside of Arc Welding," first of a new series of films on that subject being produced by Raphael G. Wolff Inc., Hollywood, Calif., will be available for distribution to the welding industry and trade and technical schools in December, it was reported last week. Designed for use in teaching, the films are in full color, 16-millimeter, with sound.

♦

An asbestos mill capable of processing large quantities of asbestos-bearing rock is now under construction on the Johns-Manville properties in Chrysotile, Ariz. According to C. H. Shoemaker, vice president of Johns-Manville Products Corp., the mill will be in operation early in 1942.

■ Steel barrels and drums, heavy types, manufactured in September numbered 1,712,681 units, against 1,589,848 in August and 1,305,497 in September, 1941, according to the Bureau of the Census. Production for nine months was 13,087,789 units, compared with 9,117,092 in the comparable period last year.

Steel Bomb Shelter Is Air-Conditioned



■ Air-conditioned bomb shelter built of 7-gage corrugated steel of high flexibility attracted considerable interest at the American Metal Congress in Philadelphia recently. The shelter fits into a built up steel box, is buried at least three feet underground. Walls of the outer and inner shelters are separated by an insulating space for added protection. The structure is equipped with Chrysler Airtemp air-conditioning, stove, fire extinguisher, dishes, toilet, digging tools and water cooler. Not yet in mass production, the shelter is expected to cost about as much as a good automobile

Pennsylvania Repairing 3000 Cars Per Month

■ Pennsylvania railroad has underway the largest program in its history for the enlargement and improvement of its freight car supply. Program calls for the construction, during 1941 and 1942, of 11,876 new freight-carrying cars, and the complete reconditioning of approximately 3000 cars a month. This will add 9600 cars to the available supply by the close of the present year and more than 23,000 by Oct. 1, 1942, just before the annual traffic peak. By that date, also, the proportion of freight cars under or awaiting repairs will be reduced to 3.4 per cent, a minimum practicable working level.

Program also includes the building of 25 new locomotives and heavy repairs to existing engines at a rate of 200 a month.

53 Consumers' Combined Profit 21% Over 1941

■ COMBINED net income earned in the third quarter by 53 iron and steel consumers totaled $39,160,354, compared with $33,752,331 aggregate profit reported by the same companies in the corresponding period in 1940. Increase for the group was 16 per cent. All reported a profit in the September quarter, while a year ago one operated at a deficit in the third period.

Thirty-nine of the companies reported a higher profit in the third quarter, 1941, than in the corresponding three months a year ago.

Aggregate net earnings for the same companies in the first nine months this year was $124,642,840, an increase of nearly 21 per cent from a total of $103,061,735 in the period in 1940. All reported a profit for the nine months, against one that had incurred a deficit a year ago.

For the three-quarter period, 50 companies earned larger profits than in the corresponding nine months last year. Summary of the reports:

	Third Quarter 1941	Third Quarter 1940	Nine Months 1941	Nine Months 1940
American Brake Shoe & Foundry Co., New York	$766,201	$629,852	$2,245,541	$1,856,490
American Radiator & Standard Sanitary Corp., New York	1,900,840§	2,184,901§	5,171,849	3,720,806
Atlas Tack Corp., Fairhaven, Mass.	51,958§	32,146§	142,272	85,332
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.	131,756	98,187	365,541	193,032
Blaw-Knox Co., Pittsburgh	397,670	584,853	1,618,166	891,952
Budd, E. G., Mfg. Co., Philadelphia	447,361	99,001	1,754,832	1,064,353
Budd Wheel Co., Philadelphia	351,617	182,612	1,056,490	577,057
Caterpillar Tractor Co., Peoria, Ill.	1,575,156	1,977,122	5,873,696	5,486,636
Central Foundry Co., New York	129,305	27,396	303,358	62,564
Checker Cab Mfg. Corp., Kalamazoo, Mich.†	40,536	338,597	243,469	516,188
Clark Equipment Co., Buchanan, Mich.	541,979	211,756	1,523,033	1,133,008
Continental Cushion Spring Co., Chicago	8,492	9,218	17,917	16,161
Continental Motors Corp., Muskegon, Mich. (a)	1,012,035	181,399	2,236,164	389,138
Cutler-Hammer Inc., Milwaukee	303,439§	182,864§	1,242,542	925,227
Dresser Mfg. Co., Bradford, Pa.	438,589	368,016	814,370	844,497
Driver-Harris Co., Harrison, N. J.	143,480	100,266	534,100	331,742
Eaton Mfg. Co., Cleveland	1,121,087	814,502	3,100,851	2,722,850†
Electromaster Inc., Detroit	45,130	10,957	60,908	20,917
Emsco Derrick & Equipment Co., Los Angeles	211,106	50,909*	516,625	18,716
Evans Products Co., Detroit	159,814§	124,540§	387,449	109,151
Federal Mogul Corp., Detroit	142,449	131,124	496,994	467,968
Federal Screw Works, Detroit	130,675	23,676	312,540	77,538
Ferro Enamel Corp., Cleveland	126,640	69,848	450,539	319,042
Florence Stove Co., Gardner, Mass.	408,694	419,823	972,728	862,968
General Electric Co., Schenectady, N. Y.	11,468,016	11,113,204	37,471,681	37,094,776
General Railway Signal Co., Rochester, N. Y.	234,461	106,555	511,836	344,474
General Steel Castings Corp., Eddystone, Pa.	1,034,465	429,405	2,725,365	502,363
Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.	220,142	55,102	548,191	328,288
Gillette Safety Razor Co., Boston	941,547	605,323	2,333,337	1,938,775
Houdaille-Hershey Corp., Detroit	240,603	100,173	1,757,694	1,572,884
Jackson, Byron, Co., Huntington Park, Calif.	229,414	16,962	407,260	258,280
Johns-Manville Corp., New York	1,470,183	1,638,312	4,488,984	3,526,325
Kingston Products Corp., Kokomo, Ind.	96,520	17,956	196,071	35,880*
LeTourneau, R. G., Inc., Peoria, Ill.	603,139	306,949	2,216,887	1,458,992
Lynch Corp., Anderson, Ind.	150,415	75,862	432,125	292,110
Marion Steam Shovel Co., Marion, O.	106,880	117,650	428,999	319,289‡
Master Electric Co., Dayton, O.	188,342	91,260	639,152	541,558
Minneapolis-Honeywell Regulator Co., Minneapolis	917,982	964,440	2,022,260	1,568,361
Mullins Mfg. Corp., Salem, O.	154,883	88,975	691,813	255,395
National Cash Register Co., Dayton, O.	1,224,043	392,554	2,548,734	1,492,385
National Malleable & Steel Castings Co., Cleveland	402,099	312,457	1,345,669	931,214
Noblitt-Sparks Industries Inc., Columbus, Ind.	326,598	202,530	899,128	653,596
Otis Elevator Co., New York	402,529	769,328	1,892,948	2,552,957
Seagrave Corp., Columbus, O.	7,868	1,045	65,274	19,185
Transue & Williams Steel Forging Corp., Alliance, O.	64,675	9,388	167,728	44,667
Twin Coach Co., Kent, O.	128,013	170,352	511,326	380,352
Underwood Elliott Fisher Co., New York	935,012	303,839	2,552,226	1,377,223
U. S. Hoffman Machinery Corp., New York	176,879	92,464	579,294	257,706
Victor Equipment Co., San Francisco	45,262	44,816	147,578	116,632
Warner & Swasey Co., Cleveland	1,181,482	668,855	3,484,915§	2,805,775§
Westinghouse Air Brake Co., Wilmerding, Pa.	1,192,285	1,305,287	5,203,665	4,509,287
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.	4,291,849	4,746,316	15,860,249	14,583,328
Yale & Towne Mfg. Co., Philadelphia	138,759	253,225	1,095,753	678,105

§ Indicated; (a) period ended July 31; † before excess profits taxes; ‡ before federal taxes; *loss.

Taylor-Wharton Lights New Electric Furnace

■ New electric furnace recently installed for manganese steel production by Taylor-Wharton Iron & Steel Co., High Bridge, N. J., was put into operation Oct. 29. Placing the company's High Bridge plant on a 100 per cent electric steel-making basis, the new equipment was reported to have cost $50,000.

Hadfield's manganese steel, major type of steel produced at the plant, will be made in the furnace which, it is said, will be "an important factor in conserving ferromanganese . . ." The first heat of manganese steel was drawn in this plant in 1892 by Sir Robert Hadfield, and was produced in a 3-ton bottom blow converter.

M. F. Apgar, formerly superintendent of the High Bridge plant, and the company's present-day ranking service employe, turned the switch for the first heat. G. R. Hanks, president; L. N. Aller, secretary and treasurer; L. E. MacFadyen, plant superintendent; and E. E. Alexander, plant engineer, also attended the ceremony.

Washer Manufacturers To Co-ordinate Facilities

■ Washing and ironing machine manufacturers who recently were awarded a $12,000,000 government contract for machine gun parts met in Chicago, Nov. 3, to accelerate production. It was stated that nearly all members of the industry are sharing in the contract.

W. Neal Gallagher, Newton, Iowa, president, American Washer and Ironer Manufacturers Association, said the industry is establishing technical divisions to handle the job.

Wilbur H. Winters, former vice president, American Brake Shoe & Foundry Co., New York, has been retained as co-ordinator by the prime contractors, the Easy Washing Machine Corp., Syracuse, N. Y.; Apex Electrical Mfg. Co., Cleveland; and Nineteen Hundred Corp., St. Joseph, Mich.

The contract was awarded to relieve the manufacturers of hardships resulting from OPM's curtailment of washers and ironers.

■ Orders for steel boilers received during September numbered 1128, compared with 1246 in August and 1557 in September, 1940, according to the Bureau of the Census. Total orders booked in nine months this year were 11,231, compared with 7741 for the corresponding period in 1940.

September Steel Shipments from Warehouses 62 Per Cent for Defense

■ SIXTY-TWO per cent of steel shipments from warehouses in September bore preference ratings of A-10 or higher according to an analysis of reports from 260 warehouses to the American Steel Warehouse Association, Cleveland.

This percentage compares with the highest official estimate of steel required for defense production—43 per cent of total 1942 output.

As in past months warehouse shipments were higher than receipts and the greatly diminished stocks of steel on hand were reduced even further.

September shipments from stocks were 22 per cent higher than receipts from mills with the result warehouse inventories in the country as a whole were 7 per cent lower on Oct. 1 than on Sept. 1.

Assuming that steel warehouses should have received one-third of their quarterly quota, then during September receipts from mills amounted to 81 per cent of such monthly quota.

While these figures represent the situation as it existed in the country as a whole, there were wide variations in different territories. Although warehouse shipments were, on the average, 61.7 per cent for defense purposes, in only two territories were defense sales less than 50 per cent of total sales. Northern Ohio was highest with 79 per cent of sales in the defense brackets, Southern California next at 74 per cent. The Pacific Northwest states, 73 per cent, and Pittsburgh, 70.2 per cent, also had defense percentages above 70.

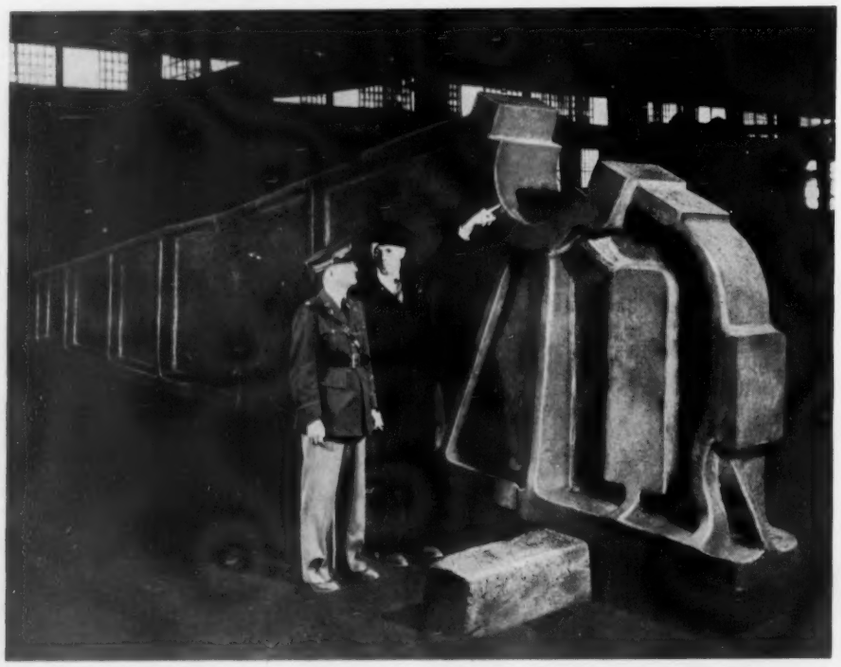
Northern California warehouses sold 116.5 per cent more steel than they received from the mills in September. The Pacific Northwest warehouses shipped 76 per cent more from stocks than they received; those in Minnesota, 89 per cent. In four districts, Northern Ohio, Philadelphia, New York and Pittsburgh, shipments from stocks were greater than receipts by 7 to 26 per cent.

This excess of shipments from stocks over receipts depleted warehouse inventories 24 per cent in Northern California and 16 per cent in Wisconsin. Three other areas lost about 15 per cent of their Sept. 1 inventories. Other districts lost from 6 to 14 per cent of their stocks.

While on the whole, warehouses received in the month of September 80.8 per cent of their quotas of steel for the month, success in this respect varied greatly by territory. Only the Missouri Valley received more than one-third of the quarter's quota in September. The Central States, Connecticut, Northern Ohio and Philadelphia received 92 to 98 per cent of their quotas. Minnesota, 47 per cent, and Southern States 49 per cent, were the only areas receiving less than half expected supplies.

Figures are subject to revision as additional reports are received, and embrace few of the merchant products, such as pipe, wire, galvanized products and reinforcing bars.

Why Steel Is So Precious



■ Major G. H. Knode, chief of artillery inspection, Pittsburgh ordnance district, and J. R. Patterson, vice president of Mackintosh-Hemphill Co., inspecting a side frame section for a 16-inch coast defense gun in the company's Midland, Pa., plant.

In this plant, "birthplace of America's largest guns," all the mounting sections are cast, 10 pieces per gun, including side frames like the one illustrated. Together they weigh 420,000 pounds. When the gun is mounted on them, the total weight is 702,000 pounds—enough steel to make approximately 350 autos, or 31,000 refrigerators or 4600 washing machines.

"All this for one rifle, while America has nearly 5000 miles of coastline to defend, not counting Hawaii and the canal zone and all the rest of the western hemisphere, an indication of why steel is so precious," said Mr. Patterson.

Admiral To Address Gary Steelworkers

■ Admiral William H. Standley, United States Navy, will speak at three Armistice day defense rallies in Gary, Ind., Nov. 10. The visit was arranged specifically for him to address steelworkers in Carnegie-Illinois Steel Corp. plants.

First speech will be presented before employes in the Gary steelworks. Hundreds of plant supervisors will later hear him speak at a luncheon, and the third address will be given at a defense production rally in Gary's Memorial auditorium. Over 4000 steelworkers are expected in the latter audience.

Admiral Standley recently returned from Russia, where he headed the American naval section in the Russo-British-American supply conference at Moscow. Retired from the navy in 1937 because of statutory age limits, he has since been recalled to active duty.

■ Industrial eye accidents in 1940 cost more in time and money than strikes, according to Ira Mosher, vice president and general manager, American Optical Co., Southbridge, Mass. Cost of the accidents to American industry in lost time, medical expenses and compensation in the year was estimated at $50,000,000.

Air Corps' Awards Comprise More Than 70% of Army's Orders in Week

■ CONTRACTS for airplanes, aircraft engines, parts and subassemblies comprised more than 70 per cent of the $298,727,976 national defense awards reported last week by the War Department. Most orders reported by other branches of the Army were small, and indicated the progressively wider distribution of defense awards among manufacturers who heretofore had not participated in this type of work. The orders included:

Ordnance Department Awards

Air Reduction Sales Co., New York, bronze rods, $2454.

Allegheny Ludlum Steel Corp., Brackenridge, Pa., gages, $4495.

Aluminum Specialty Co., Manitowoc, Wis., cartridge cases, $446,750.

American Brake Shoe & Foundry Co., American Forge Division, Chicago, shells, $532,440.

American Brass Co., Waterbury, Conn., gilding metal coils, $3363.

American Broach & Machine Co., Ann Arbor, Mich., machinery, $152,995.

American Chain & Cable Co., Detroit, cable and fittings, assemblies, $4280.

American Hollow Boring Co., Erie, Pa., steel tubes, $23,691.

American Locomotive Co., Railway Steel-Spring Division, New York, helical springs, $4964.

American Steel & Wire Co. of N. J., Philadelphia, firing pin springs, $4150.

American Type Founders Inc., Elizabeth, N. J., recoil mechanisms, guns, $3,142,500.

Anderson Engineering Co., New York, dies, $4875.

Atlas Imperial Diesel Engine Co., Mattoon, Ill., shells, $770,804.

Atlas Press Co., Kalamazoo, Mich., lathes and equipment, $104,490.

Autocall Co., Shelby, O., test sets for control systems, $8969.

Avey Drilling Machine Co., Covington, Ky., drilling machines, $19,753.

Axelson Mfg. Co., Los Angeles, lathes, $40,077.

Babcock & Wilcox Tube Co., Beaver Falls, Pa., seamless steel tubing, $4454.

Bantam Bearings Corp., South Bend, Ind., bearings, $7486.

Barber-Colman Co., Rockford, Ill., machine tools, $120,570.

Barnes Drill Co., Rockford, Ill., machine tools, $225,932.

Beckwith Mfg. Co., Dover, N. H., scabbards, $750,000.

Bendix Aviation Corp., Eclipse Aviation Division, Bendix, N. J., parts for tanks, $4046.

Berger Mfg. Co., South Boston, Mass., steel clothes lockers, $3868.

Bliss & Laughlin Inc., Harvey, Ill., steel, $3936.

Bokum Tool Co. Inc., Detroit, tools, $8018.

Bonney Forge & Tool Works, Allentown, Pa., wrenches, $14,215.

Bradford Machine Tool Co., Cincinnati, gear head lathes and oil pumps, $259,527.

Bradley, C. C., & Son Inc., Syracuse, N. Y., hammers, $6817.

Brill, J. G., Co., Philadelphia, carriages, $1,042,560.

British Purchasing Commission, New York, presses, $43,253.

Brown & Sharpe Mfg. Co., Providence, R. I., grinding and milling machines, vises, tools, $568,227.

Budd Wheel Co., Detroit, wheel disc and rim assemblies, $13,864.

Buell Die & Machine Co., Detroit, dies, $5194.

Carbide Tool Co., Chicago, reamers, cutters and arbors, $15,100.

Carlton Machine Tool Co., Cincinnati, machine tools, $79,692.

Carnegie-Illinois Steel Corp., Boston, steel bar, $7198.

Carpenter Steel Co., Philadelphia, steel for tools, $13,518.

Cedar Rapids Engineering Co. of Delaware, Cedar Rapids, Iowa, grinding machines, $9500.

Champion Spark Plug Co., Toledo, O., spark plugs, $13,800.

Chase Brass & Copper Co. Inc., Waterbury, Conn., bronze and brass, metal parts for fuzes, brass rod, $411,871.

Chaso Tool Co., Royal Oak, Mich., die heads, grinders and chasers, $23,770.

Cincinnati Lathe & Tool Co., Cincinnati, machine tools, $99,645.

Cincinnati Milling Machine & Cincinnati Grinders Inc., Cincinnati, milling and cutter machines, grinders, machine tools, parts, $1,579,083.

Cincinnati Planer Co., Cincinnati, parts for planer, $9253.

Cleveland Twist Drill Co., Cleveland, reamers, $4633.

Cohn & Rosenberger Co. Inc., Providence, R. I., copper gaskets, $6048.

Colonial Broach Co., Detroit, broaches, $6375.

Colt's Patent Fire Arms Mfg. Co., Hartford, Conn., guns, parts, $8,354,675.

Consolidated Packaging Machinery Corp., Buffalo, dipping machines, $6105.

Continental Motors Corp., Muskegon, Mich., parts for tanks, $8567.

Crucible Steel Co. of America, New York, steel bars, $13,127.

Darling Valve & Mfg. Co., Williamsport, Pa., shells, $595,680.

De Sanno, A. P., & Son Inc., Phoenixville, Pa., tools, $11,607.

Detroit Harvester Co., Dura Co. Division, Toledo, O., cartridge cases, $1,650,000.

Diecasters Inc., Ridgefield, N. J., die castings, $5705.

Disston, Henry, & Sons Inc., Philadelphia, plates, $46,236.

Eastern Industrial Sales Co., New York, trucks, $5945.

Eastman Kodak Co., Rochester, N. Y., optical pressings and elements, $1,684,248.

Exact Weight Scale Co., Columbus, O., scales, $23,328.

Ex-Cell-O Corp., Detroit, tool grinders' machines, $6442.

Federal Tool Corp., Chicago, gages, $10,265.

Fellows Gear Shaper Co., Springfield, Vt., machine tools, $53,120.

Fitchburg Grinding Machine Co., Fitchburg, Mass., grinding machines, $109,620.

Florence Stove Co., Gardner, Mass., ammunition boxes, $166,250.

Frost Co., Kenosha, Wis., cartridge cases, $886,000.

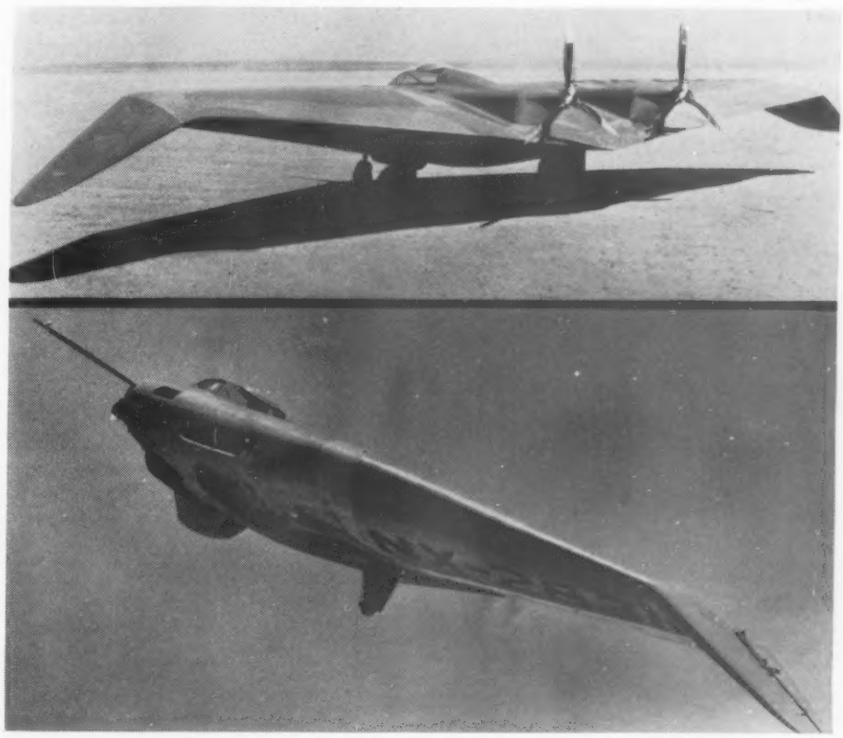
Fruehauf Trailer Co., Detroit, tractor crane trailers, $30,874.

Gardner Machine Co., Beloit, Wis., grinders, $15,380.

General Engineering & Mfg. Co., St. Louis, shapers, $12,819.

General Motors Corp., Detroit, trucks, $187,140; Ternstedt Mfg. Division, Detroit, magazines, $13,050; New Departure Division, Bristol, Conn., ball bearings, $4567; Delco Appliance Division, Rochester, N. Y., directors, $1,-

Flying Wing Proves Airworthy



■ **Airworthiness of the Northrup "Wing", a tail-less aircraft of radically new design, has been proved in more than 200 test flights. Top photo shows a rear view of the flying wing with its two pusher propellers; below, a head-on view of the ship in flight. Photo Aeronautical Chamber of Commerce, Washington**

760,640.
General Tool Sales Co., Philadelphia, steel taps, $3256.
Gisholt Machine Co., Madison, Wis., machine tools, $107,600.
Globe Steel Tubes Co., Milwaukee, seamless steel tubing, $5803.
Gorton, George, Machine Co., Racine, Wis., machinery, $81,358.
Great Lakes Steel Corp., Ecorse, Detroit, steel, 546,791.
Grissinger Machine Works, Philadelphia, punches, $3320.
Guiberson Diesel Engine Co., Chicago, engine parts, $3028.
Hamilton Metal Products Co., Hamilton, O., steel chests, $6260.
Harrington & Richardson Arms Co., Worcester, Mass., pistols, $2,402,982.
Heald Machine Co., Worcester, Mass., machine tools, $146,995.
Hendey Machine Co., Torrington, Conn., lathes, $363,284.
Hoe, R., & Co. Inc., New York, excess recoil mechanism parts, machine tools, $54,133.
Independence Pneumatic Tool Co., Chicago, machine tools, $135,740.
Ingersoll-Rand Co., New York, boiler feed pumps, drills, $8829.
International Harvester Co. Inc., Chicago, parts for tractors, shells, parts for tanks, $749,487.
International Machine Tool Corp., Indianapolis, lathes, $34,426.
International Nickel Co. Inc., New York, copper nickel alloy cylinders, $116,012.
Irwin Auger Bit Co., Wilmington, O., screwdrivers, $5874.
Johnston & Jennings Co., Cleveland, copper nickel alloy cylinders, $37,750.
Jones & Lamson Machine Co., Springfield, Vt., machine tools, $172,512.
Jones Machine Tool Works Inc., Philadelphia, machine tools, $90,112.
Jones, S. M., Co., Toledo, shot, body forgings for shot, $2,600,000.
Kearney & Trecker Corp., Milwaukee, machine tools, $415,116.
Kidde, Walter, & Co. Inc., New York, fire extinguishers, $19,474.
Kramer, H., & Co., Chicago, manganese bronze, $4000.
Krueger, H. R., & Co., Detroit, facing machines, $10,065.
Landis, A. B., Sons Inc., Wyndmoor, Pa., punches, $7272.
Latrobe Electric Steel Co., New York, steel bar, $4021.
LeBlond, R. K., Machine Tool Co., Cincinnati, lathes, gun drilling, boring, and rifling machines, machine tools, $1,371,510.
Leidy Electric Co., Phillipsburg, N. J., cable and wire, $2688.
Lincoln Tool & Die Co., Detroit, punches and dies, $3776.
Lodge & Shipley Machine Tool Co., Cincinnati, machine tools, $316,411.
Madison-Kipp Corp., Madison, Wis., diecasting machines, furnaces and pyrometers, $5940.
Magee Sheet Metal Machinery Co., Ypsilanti, Mich., parts for machines, $3600.
Manville, E. J., Machine Co., Waterbury, Conn., ball headers, $23,882.
Mattatuck Mfg. Co., Waterbury, Conn., parts for primers, $40,000.
McCord Radiator & Mfg. Co., Detroit, clip filling machines, $10,000.
Mead Screw Products Inc., Detroit, shot, $140,000.
Metal Box & Cabinet Co., Chicago, steel chests, $10,022.
Metal Goods Corp., St. Louis, brass rods, copper rods, copper, naval brass and copper tubing, $5130.
Metals Reserve Co., Washington, pig tin, $5824.
Michigan Tool Co., Detroit, high speed steel milling cutters, $4888.
Midwest Tool & Mfg. Co., Detroit, cutting tools, $7781.
Millers Falls Co., Greenfield, Mass., gages, $7267.
Miller Printing Machinery Co., Pittsburgh, parts for tanks, $13,057.
Modern Tool & Die Co., Philadelphia, gages, $11,160.
Monarch Machine Tool Co., Sydney, O., precision lathes, $22,608.
Morris Machine Tool Co., Cincinnati, radial drilling machines, $25,488.
Morse Tool Co. Inc., Detroit, tools, $76,920.
Morton Mfg. Co., Chicago, ammunition chests, $225,860.
Murchey Machine & Tool Co., Detroit, chasers and die heads, $5290.
National Acme Co., Cleveland, machine tools, $473,934.
National Machinery Co., Tiffin, O., machine tools, $132,700.
National Pneumatic Co., Rahway, N. J., guns, $3,848,460.
National Twist Drill & Tool Co., Detroit, twist drills, $3118.
Niles-Bement-Pond Co., Pratt & Whitney Division, West Hartford, Conn., machine tools, drill points, equipment, $545,674.
Northern Engraving & Mfg. Co., La Crosse, Wis., cartridge cases, $448,750.
Norton Co., Worcester, Mass., machine tools, $169,766.
O'Brien Machinery Co., Philadelphia, machine tools, $163,120.
Ohio Seamless Tube Co., Shelby, O., seamless tubing, $6601.
Ohio Steel Foundry Co., Lima, O., molybdenum castings, $113,321.
Ohio Tool Co., Cleveland, gages, $12,300.
Oliver Farm Equipment Co., Chicago, projectiles, $228,837.
Onsrud Machine Works Inc., Chicago, machine tools, $125,386.
Otis Steel Co., Cleveland, steel, $3507.
Pellow Machine Co., Detroit, slotting machines, $4090.
Philco Corp., Philadelphia, fuzes, $1,570,000.
Pittsburgh Tube Co., Pittsburgh, steel tubing, $12,390.
Poor & Co., Canton Forge & Axle Works. Canton, O., forgings for tanks, $12,182.
Prentiss, Henry, & Co., Boston, boring, drilling and milling machines, $162,229.
Pullman-Standard Car Mfg. Co., Butler, Pa., shells, $3,070,000.
Putnam Tool Co., Detroit, cutters, reamers, $3960.
Reed Mfg. Co., Erie, Pa., strap wrenches, $5117.
Reed Prentice Corp., Worcester, Mass., machine tools and toolroom lathes, $202,196.
Remington Arms Co. Inc., Bridgeport, Conn., rifles, cartridges, $9,841,180.
Republic Steel Corp., Chicago, steel, $10,470.
Revere Copper & Brass Inc., Rome Mfg. Co. Division, Rome, N. Y., brass forgings, $215,250.
Robinson Mfg. Co., Muncy, Pa., preheaters, $26,997.
Rock-Ola Mfg. Corp., Chicago, ammunition boxes, $951,333.
Rockwood Alabama Stone Co., Russellville, Ala., shells, $1,026,150.
Rumsey Electric Co., Philadelphia, wire, $4054.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y., nuts, $2834.
Safe Guard Corp., Lansdale, Pa., gages, $3109.
Savage Arms Corp., J. Stevens Arms Co. Division, Chicopee Falls, Mass., rifles, $2798; Utica, N. Y., Division, rifles $30,402,000.
Scovill Mfg. Co., Waterbury, Conn., fuzes, booster parts, percussion primers, $1,458,465.
Scully-Jones & Co., Chicago, tools, $3420.
Service Supply Corp., Philadelphia, tractors, $3705.
Shipley, W. E., Machinery Co., Philadelphia, shaper with regular equipment, parts for case turning machine, $6018.
Sieg Co., Davenport, Iowa, wrenches and adapters, $11,917.
Sipp-Eastwood Corp., Paterson, N. J., cutters, $6917.
Smith, A. O., Corp., Milwaukee, ammunition, $26,716,800.
Smith & Mills Co., Cincinnati, machine tools, $86,100.
Smith & Wesson Inc., Springfield, Mass., gun parts, $3030.
Solar Sturges Mfg. Co., Melrose Park, Ill., bundle packing accessories, $63,617.
South Bend Lathe Works, South Bend, Ind., machine tools, $330,349.
Sowers Mfg. Co., Buffalo, mixing kettles, $31,875.
Sperry Gyroscope Co., Brooklyn, N. Y., directors, $14,901,500.
Stamford Rolling Mills Co., Springdale, Conn., gilding metal coils, $12,100.
Standard Gage Co. Inc., Poughkeepsie, N. Y., gages, $11,979.
Stanley Works, Stanley Tools Division, New Britain, Conn., punches, $4857.
Sterling Products Co., Moline, Ill., tools

Russian Amphibian Tanks Cross River

■ **Soviet amphibian tanks make their way across a river as the Russians defend their terrain against the German advance. The United States Army is building a quantity of the land-water tanks. NEA photo**

and wrenches, $6639.
Stevens Mfg. Mills, Muscoda, Wis., ammunition boxes, $460,030.
Stewart-Warner Corp., Chicago, grease guns, fuses, $2,608,314.
Stokes, F. J., Machine Co., Philadelphia, punches and dies, $3382.
Stoner Mfg. Co., Aurora, Ill., cartridge cases, $176,250.
Superior Die Casting Co., Cleveland, die castings, $8578.
Swind Machinery Co., Philadelphia, milling machines and toolmakers' lathes, $41,081.
Taylor-Wharton Iron & Steel Co., Easton, Pa., compressed gas cylinders, $5795.
Tecumseh Products Co., Tecumseh, Mich., shot, $169,000.
Timken Roller Bearing Co., Canton, O., roller bearings, $4471.
Tokheim Oil Tank & Pump Co., Ft. Wayne, Ind., shot, $2,791,090.
Towmotor Co., Cleveland, lift trucks, $2287.
Triad Tool & Die Co., Newark, N. J., pins, bolts, punches, $13,219.
Triplex Machine Tool Corp., Dayton, O., screw machines, $4538.
Troyke, Alfred A., Cincinnati, machine tool attachments, $9270.
Tungsten Electric Corp., Union City, N. J., dies, $3667.
Uchtorff Co. Inc., Davenport, Iowa, ammunition chests, $515,565.
Union Electric Steel Co., Pittsburgh, tube forgings, $177,450.
United Engineering & Foundry Co., Pittsburgh, howitzers, $1,021,377.
U. S. Automatic Corp., Amherst, O., closing plugs, $22,276.
U. S. Cartridge Co., Baltimore, cartridges, $1,157,200.
U. S. Hoffman Machinery Corp., Syracuse, N. Y., shells, $1,648,000.
Utica Cutlery Co., Utica, N. Y., bayonets, $794,000.
Van Norman Machine Tool Co., Springfield, Mass., tools and machinery, $300,-198.
Veit & Young, Philadelphia, bottom dies, $6480.
Verson Allsteel Press Co., Chicago, press brakes, $3470.
Vickers Inc., Waterbury Tool Division, Waterbury, Conn., speed gears, $289,-991.
Warner & Swasey Co., Cleveland, machine tools, $165,390.
War Supplies Ltd., Ottawa, Canada, tracks, $560,250.
Webber Gage Co., Cleveland, gage blocks, $7500.
Weber, David, & Co., Philadelphia, double wall liners, $3060.
Weinstein, S., Supply Co., New York, padlocks, $16,352.
Western Cartridge Co., East Alton, Ill., cartridges, $204,102; Winchester Repeating Arms Co. Division, New Haven, Conn., rifles, $5,791,200.
Western Corp., Chicago, ball bearings, $7416.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., electric gearmotors and control equipment, $26,840.
Wisconsin Steel Co., Chicago, steel bar, $4122.
Wood, John, Mfg. Co., Conshohocken, Pa., galvanized steel boxes, $982,100.
Wright Aeronautical Corp., Paterson, N. J., engine parts, $10,882.
Yale & Towne Mfg. Co., Stamford, Conn., padlocks, $19,675.
York Safe & Lock Co., York, Pa., proof testing guns and carriages, $29,909.
Youngstown Sheet & Tube Co., Youngstown, O., steel, $11,257.
Zimmerman Steel Co., Bettendorf, Iowa, steel castings, $9320.

Air Corps Awards

Aerial Machine & Tool Corp., New York, trigger motor assemblies, $36,947.
Austin-Western Road Machinery Co., Aurora, Ill., road sweepers, $210,678.
Aviation Mfg. Corp., Williamsport, Pa., tools for overhauling engines, $56,600.
Bell Aircraft Corp., Buffalo, spare parts for aircraft, $82,857.
Bendix Aviation Corp., Pioneer Instrument Division, Bendix, N. J., compasses and inverters, $2,451,000.
Continental Electric Co. Inc., Newark, N. J., portable electric power plants, $264,500.
Crosley Corp., Cincinnati, shackle assemblies, bolt and bracket assemblies, $745,879.
Curtiss-Wright Corp., Curtiss Propeller Division, Caldwell, N. J., tool kits, $224,364.
Douglas Aircraft Co., Santa Monica, Calif., maintenance parts for airplanes, cable assemblies, $338,307.
Duro Co., Dayton, O., gun mount assemblies, $64,464.
Edgewater Steel Co., Pittsburgh, cartridge assemblies, $124,320.
Electric Auto-Lite Co., La Crosse, Wis., gage units, $69,721.
Fairchild Engine & Airplane Corp., Farmingdale, L. I., airplane spare parts, $118,341.
Garden City Plating & Mfg. Co., Chicago, wind indicator assemblies, $92,900.
General Electric Co., Schenectady, N. Y., indicators, tank units and transmitters, $51,750.
General Motors Corp., Delco-Remy Division, Anderson, Ind., generator assemblies, $318,196.
Independent Engineering Co. Inc., O'Fallon, Ill., oxygen cylinders, $829,309.
Kidde, Walter, & Co. Inc., New York, fire extinguishers, $420,330.
Leece Neville Co., Cleveland, generator assemblies, $375,300.
Lockheed Aircraft Corp., Burbank, Calif., maintenance parts for airplanes, $138,-992.
Moore-Eastwood & Co., Dayton, O., gun synchronizer generators, $81,000.
Niles-Bement-Pond Co., West Hartford, Conn., gages, $211,250.
Ohio Chemical & Mfg. Co., Cleveland, oxygen sets and filling devices, $62,-125.
Packard Motor Car Co., Detroit, engine parts, $17,726,233.
Pump Engineering Service Corp., Cleveland, pump assemblies, $96,250.
Rockford Screw Products Co., Rockford, Ill., aluminum alloy and steel bolts, $77,146.
Rolls-Royce Inc., Detroit, tools, $275,846.
Sperry Products Inc., Hoboken, N. J., mixture receiver throttle transmitters, $248,000.
Steel Products Engineering Co., Springfield, O., propeller tool assemblies, $70,876.25.
United States Gauge Co., New York, gages, $84,552.
Vultee Aircraft Inc., Nashville Division, Nashville, Tenn., maintenance parts for airplanes, $212,175.
Westinghouse Electric & Mfg. Co., Dayton, O., ammeter and voltmeter assemblies, generator voltage regulators and switch relays, $884,775.
Wright Aeronautical Corp., Paterson, N. J., maintenance tools and parts, $265,106.

Corps of Engineers Awards

Aermotor Co., Chicago, triangulation towers, bolts and anchors, $5939.
Air Conditioning Engineers Inc., Mobile, Ala., refrigerators and water coolers, $25,340.
American Rolling Mill Co., Middletown, O., equipment, $7200.
American Saw Mill Machinery Co., New York, sawmill, $4789.
Bethlehem Steel Export Corp., New York, steel pipe, $6229.
Binks Mfg. Co., Chicago, galvanized mixing material tanks, $3660.
Butler Mfg. Co., Kansas City, Mo., prefabricated steel warehouses, $57,838.
Carey Machinery & Supply Co., Baltimore, lathes, $4535.
Carnegie-Illinois Steel Corp., Johnstown, Pa., turnouts, $5375.
Carver Pump Co., Rock Island, Ill., pumping sets, $14,820.
Chicago Pneumatic Tool Co., New York, pneumatic tools, $5895.
Contractors' Material Co., Jackson, Miss., tie bars, $6075.
Darby Corp., Kansas City, Kans., bunk frames and chain, $17,139.
Food Machinery Corp., Peerless Pump Division, Canton, O., pumping sets, pipe, $9219.
Frey Industrial Supply Co., Los Angeles, rivet tool cribs, $15,643.
Furnace Supply Co., Birmingham, Ala., furnaces, $12,991.
General Motors Corp., New York, refrigerator condensing units, drinking water

Shipbuilders Work to Music

■ **Workers on the U. S. S. ALABAMA find the soothing strains of music, coming from the loudspeaker, aids them in getting the sister ship of the recently commissioned NORTH CAROLINA ready for launching. The ALABAMA is expected to be launched next February. NEA photo**

coolers, and copper tubing, $5673.
Gibbons, Boyd H., Los Angeles, trucks, $16,596.
Industrial Construction Corp. Ltd., Los Angeles, cranes, $7798.
Ingersoll-Rand Co., New York, pneumatic tools, concrete vibrator and air compressor, $57,501.
McDonald, A. Y., Mfg. Co., Dubuque, Iowa, pumping sets, $18,226.
Onan, D. W., & Sons, Minneapolis, generator sets, $17,256.
Standard Steel Works, North Kansas City, Mo., bituminous tanks and pumps, $5602.
Texas & New Orleans Railroad Co., Houston, Tex., cranes, $12,000.
Thew Shovel Co., Lorain, O., cranes and parts, $33,754.
Truscon Steel Co., Youngstown, O., hangar doors, $55,500.
United States Steel Export Co., New York, structural steel frame, nails, chain link fabric, steel galvanized pipe, $53,277.
Wheeling Steel Corp., Wheeling, W. Va., steel galvanized pipe, $9345.

Quartermaster Corps Awards

Federal Motor Truck Co., Detroit, trucks and trailers, $53,820.
General Motors Sales Corp., General Motors Parts Division, Detroit, repair parts, $4219.
Henney Motor Co., Freeport, Ill., metropolitan ambulances, $53,736.
International Harvester Co., Chicago, trucks, $220,170.
Mack Mfg. Corp., Plainfield, N. J., repair parts, $99,586.
Mayhew Steel Products Inc., Shelburne Falls, Mass., component parts for blacksmiths' tool kits, $5544.
Shirley, Olcott & Nichols, Washington, repair parts, $16,330.
Ventnor Boat Works, Atlantic City, N. J., boats, $374,000.
Wallace, R., & Sons Mfg. Co., Wallingford, Conn., table knives and forks, spoons, $63,200.

Chemical Warfare Service Awards

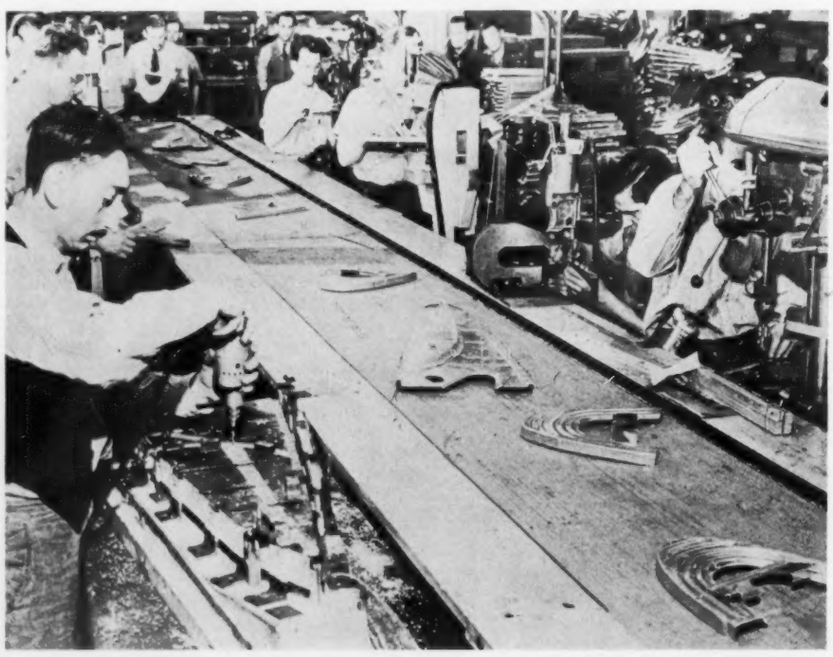
American Emblem Co. Inc., New York, brass grommets and washers, $11,247.
Continental Can Co. Inc., New York, gas mask and canister assemblies, $147,124.
Cook, H. C., Co., Ansonia, Conn., brass clinch tips, $13,753.
Doehler Die Casting Co., New York, tail plugs and primer holders, elbow nozzles, $1,173,261.
Eastern Tool Mfg. Co., Bloomfield, N. J., hook and eye clasps, $11,016.
Firestone Tire & Rubber Co., Akron, O., gas mask canisters, $32,634.
Larson Tool & Stamping Co., Attleboro, Mass., diaphragm angletubes, $30,500.
National Lead Co., New York, tin lead solder, $4979.
National Stamping Co., Detroit, outlet valve clamps, $21,200.
Revere Copper & Brass Inc., Chicago, inner tube nozzles, brass ferrules, $61,110.
Spring Products Corp., Long Island City, N. Y., clasps, $9299.
Stanley Works, New Britain, Conn., outlet valve guards, $4260.
United-Carr Fastener Corp., Cambridge, Mass., buttons and washers, brass clips, $34,704.
United Steel Barrel Co., Philadelphia, drums, $20,800.
Wackman Welded Ware Co., Chester, Pa., drums, $23,400.

Defense Corp. Approves New Lease Agreements

■ Execution of various lease agreements was authorized recently by the Defense Plant Corp., an RFC subsidiary, to provide added facilities considered essential to progress of the national defense program, it was reported by Jesse Jones, federal loan administrator. Most agreements were at the War Department's request, and title to facilities so covered will remain with the Defense Plant Corp. Authorizations included:

Vickers Inc., Detroit, $8,590,957 for construction and equipping of a plant at Detroit to be used in manufacture of aircraft equipment. Machinery and equipment will cost about $4,934,454; land and buildings, $3,656,503. Commitment will be in addition to previous one of $1,436,722 for plant at Detroit, to be used for production of aircraft and ordnance equipment.
Electronic Mechanics Inc., Paterson, N. J., $98,120 for construction and equipment of a plant at Paterson for manufacture of radio equipment. Machinery and equipment will cost about $85,120; land and buildings, $13,000.
National Supply Co., Pittsburgh, $273,536 for machinery and equipment for plant at Torrance, Calif., to be used in manufacture of aircraft parts.
Avondale Marine Ways Inc., Westwego, La., $116,000 for purchase of machinery and equipment to be used in the plant at Westwego for manufacture of naval vessels.
Babcock & Wilcox Tube Co., Beaver Falls, Pa., $969,050 for equipment at Beaver Falls to be used in production of alloy steel ingots. Annealing and tubing facilities will cost about $710,550; electric furnace erection and purchase of equipment will total about $258,500. Plant will have an estimated annual capacity of about 18,000 tons alloy steel ingots, and approximately 21,600 tons annual capacity for annealing.
Copperweld Steel Co., Warren, O., increase in commitment from $4,000,000 to $4,600,000 for additional facilities at plant to be located in Warren.
Curtiss-Wright Corp's Curtiss Propeller Division, increase in agreement from $1,769,600 to $1,885,600 for additional facilities for the plant at Caldwell, N. J. Also increase from $7,099,650 to $8,991,150 for additional facilities for the plant at Indianapolis.
Bendix Aviation Corp., South Bend, Ind., (Julien B. Friez & Sons Division) $380,716 for the construction and equipping of a plant at Baltimore to manufacture aircraft equipment. Land and buildings will take about $232,200; equipment, about $148,516.
General Motors Corp., Fisher Body Division, Flint, Mich., $25,782,244 for construction and equipping of plant to manufacture military tanks. Land and buildings will take $4,822,900; equipment, $20,959,344.
Combustion Engineering Co. Inc., New York, increase for additional facilities at St. Louis plant from $105,000 to $123,000.
American Steel Foundries, East Chicago, Ind., increase for facilities to manufacture tank equipment from $9,413,901.04 to $18,486,166.92.
Willys-Overland Motors Inc., Toledo, O., increase from $1,700,000 to $1,979,759.81 for additional equipment for Toledo ordnance plant.
Wright Aeronautical Corp., Paterson, N. J., increase from $3,425,000 to $8,399,200 for additional facilities at East Paterson.
Hecker, A. W., Cleveland, $199,130 for plant to manufacture aircraft equipment.
Boeing Airplane Co., Seattle, increase from $272,500 to $401,400 for additional machinery and equipment for plant at Wichita, Kans.
Bridgeport Brass Co., Bridgeport, Conn., increase for additional facilities at Indianapolis plant from $12,320,000 to $12,478,293.81.
Vanadium Corp. of America, New York, $725,000 for construction and equipping of plant at Monticello, Utah, to manufacture vanadium pentoxide.

Aircraft Plant Conveyor Speeds Production



■ Adopting mass production technique, Glenn L. Martin Co., Baltimore, has installed a conveyor belt to move bomber subassembly parts to workers. Company reports the system already has cut in half the number of man-hours required for these subassemblies, and expects even greater savings. NEA photo

Tool Industry's Effectiveness Impaired By Defense Agencies' Lack of Planning

By GUY HUBBARD
Machine Tool Editor

■ RECENT interviews with members of the machine tool industry indicate that their efforts to meet the needs of the defense program are hampered seriously by factors over which they have little or no control.

To an industry in which planning six to 12 months ahead is essential, failure of various defense agencies to determine ahead of time what their machine tool requirements are to be obviously presents special problems.

Another thing which adds to the difficulties of machine tool builders is the extraordinary amount of "red tape" now involved handling lend-lease orders.

Typical of the lack of planning, is the extent to which government agencies attempt to switch specially tooled machines, such as multiple spindle automatics and turret lathes from one defense project to another —*after* the special tooling has been designed, built and installed.

In a recent case of that kind, a machine was about to be shipped when word came from Washington to switch it from one defense project to another, requiring entirely different tooling, and still make immediate shipment.

Planning Would Speed Program

The machine tool builder "burned the wires" explaining that it had taken six weeks to tool up the machine; that the first customer still needed it for a highly essential project; that the tooling cost almost as much as the machine; and that other similar machines could be found which would take care of the other party just as well, without throwing away six weeks' work and hundreds of dollars' worth of special tool engineering. He won after a vigorous argument.

Many of these sudden switches have been due to official whims, others have been due to pressure on the part of influential machine tool users; but most of them have been due to shifts in importance between one program and another, or to sudden expansion of projects, such as the tank program.

Whatever the cause, the effect on the machine tool builders is serious and they are inclined to think that if the governmental agencies would do at least as good a job of forecasting and advance planning as the machine tool industry itself has done and is doing, the defense program would develop much more speed.

Still another source of irritation to the builders is the frequent discovery that critical or vital machines which they have worked night and day to deliver on schedule, subsequently lie idle for weeks after delivery, in plants which are not yet ready for the overall production setup.

Review of tools held under such conditions has led to their reallocation to other projects where immediate use can be made of them. Therefore, machine tool builders favor a general review of the situation, so that premature delivery is not demanded, and that tools already prematurely installed be immediately shifted to points where they will go into action.

Members of the industry would like to see further application of the "pool order" plan, under which shops can be run at capacity on specified types of needed standard machines, the disposal of which is through individual selling efforts, but on which the industry is protected by the government in case no market should exist when the machines are ready.

Another thing "which should be done" is to take steps to curb "over ordering" of machine tools by primary contractors, who intentionally or unintentionally have over-estimated their needs. This evil extends also to promiscuous specifying of machines equipped with every conceivable refinement, when as a matter of fact much simpler machines would do just as well.

It is believed lend-lease orders would be expedited if the cumbersome procedure now followed is simplified. When Great Britain requests certain machine tools the order is passed through at least 20 hands before it gets to a machine tool builder for action.

Part of this is traditional legal routine in the establishment and transfer of title; part of it is review by Army and Navy experts to determine whether the equipment can be spared; and part of it undoubtedly is plain old-fashioned government "red tape."

A solution proposed by machine tool men for this problem is direct lending of government funds to British authorities for purchase of specific tools on which a quick checkup has indicated the need.

In that case instructions could then be issued directly by the British authorities to the American machine tool plant, enabling it to ship immediately to destination upon completion of the machine.

One machine tool builder remarked that with the industry already operating at the rate of $840,000,000 per year, it can be compared to a machine that has been speeded up close to its theoretical capacity. Unless loading and unloading of work likewise is nearly 100 per cent efficient, there is not an overall efficiency comparable to 100 per cent spindle speed. The defense program will not profit fully by peak efforts of the machine tool builders, if extraordinary efforts are nullified by governmental delays in getting the machines into action, or in ineffective or ill-advised applications of them once they are in action.

Machine Tools To Be Painted Lighter Gray

■ New and lighter shade of "machine tool gray" has been endorsed by the National Machine Tool Builders' Association, Cleveland, as standard finish for machine tools.

Date of adoption of the new color standard is optional, permitting each machine tool builder to time the change from the old to the new standard as best fits his circumstances and his customers' requirements.

Color cards of the new standard, known as 7-B, have been sent to members by the association office.

Adoption of the new color standard followed a report by Wendell E. Whipp, president, Monarch Machine Tool Co., Sidney, O., chairman of the association's color standards committee, before the association's annual convention in Chicago on Oct. 13.

In his report Mr. Whipp stated that a vote showed most machine tool builders in favor of a light color and that the trend among large machine tool users was toward a lighter color for machine tool equipment.

Mr. Whipp explained that although the new lighter shade shows up dirt and fingerprints more easily than the old, the factor chiefly desired by large machine tool users is good light reflection value. One large user, according to his report, had painted all the machine tools in one shop with this lighter color and found a 33 1/3 per cent better light at working height and also greater pride in machines and good operation on the part of the operators.

All suppliers have been advised of the change so that the new color is available from any paint manufacturer both in quick-drying spraying lacquers and in brushing enamels.

Canada Tightens Control Over All Imports of Steel Products

TORONTO, ONT.

■ F. B. KILBOURN, Canadian Steel Controller, has ordered all importers of steel and steel products from the United States to submit before Nov. 15, one copy of all orders already placed, accepted, submitted, or pending acceptance in the United States, and now outstanding unshipped. The instructions also cover all orders for steel and steel products for further processing or fabrication in Canada. One copy of all new orders must be submitted, henceforth. Machinery, equipment, and spare parts are exempt.

In addition to full details as to purpose for which steel will be used, importers must give the weights of materials. Failure to comply may result in cancellation of orders. This action has been taken "to facilitate the import into Canada of steel for essential purposes."

The Canadian government has announced substantially enlarged program of shipbuilding in the dominion, for warships and cargo vessels. Under the Wartime Merchant Shipping Ltd., a government owned company, the cargo boatbuilding program will be increased by more than 50 per cent, and already contracts have been placed with Quebec builders for additional 19 large cargo ships, while still other orders are pending.

Under the enlarged program Canadian Vickers Ltd., Montreal, received an order for six freighters to cost upwards of $10,000,000; Marine Industries Ltd., Sorel, Que., also will build six additional freighters to cost more than $10,000,000, while Davie Shipbuilding & Repairing Ltd., Lauzon, Que., subsidiary of Canada Steamship Lines Ltd., received orders for seven more freighters to cost more than $12,000,000.

140 Vessels in Program

Previously shipyards on the British Columbia coast received orders for some 90 cargo vessels of 9300 tons, and it is reported that with the new orders just placed with Quebec yards and other contracts pending, Canada's shipbuilding program will include upwards of 140 merchant vessels, and represent expenditure of more than $260,000,000.

The government recently placed contracts for two Tribal type destroyers to be built in eastern Canada. To meet the steel requirements Canada must depend largely on the United States. C. D. Howe, Minister of Munitions and Supply, stated that steel needed for the construction of the two destroyers has been assured from United States sources, and it is hoped steel will be forthcoming steadily from the United States for the cargo vessels.

Marine Industries Ltd., Sorel, made a new shipbuilding record for the dominion, with the launching of eight war craft, four Corvettes and four minesweepers, on a single day last week.

Government officials have announced that plans are under consideration for erecting a boiler plant on the property of Canadian Vickers Ltd., at Montreal, to cost $1,000,000, for producing boilers and allied equipment for Canada's wartime shipbuilding program.

With the exception of aircraft, counted in dollar value, Canada has shipped more munitions and war supplies to Great Britain than has the United States, Mr. Howe stated. He added that he saw no prospect of an early termination of the war. The Department of Munitions and Supply is planning for continued expansion of Canadian production and now is figuring on achieving maximum output in 1944.

The 25 per cent cut from 1940 levels in production of washing machines and radios will result in saving large quantities of materials for vital war industry, according to the Department of Munitions and Supply. Saving in raw materials from these products alone will include 1825 tons of steel; 85 tons of cast aluminum; 50 tons of brass; 92 tons of copper; 850 tons of iron (cast, hot rolled bars and pipe); 25,000 electric motors; 5000 switches; and 9000 gas engines.

To Increase Nickel Output

J. L. Isley, Minister of Finance, said agreements have been entered into which will involve expenditure of $35,000,000 to increase production of vital war metals in Canada for the Dominion and the United States.

Major single outlay will be made by International Nickel Co. of Canada Ltd., Sudbury, Ont., which will meet a request of Canadian and United States authorities to increase nickel production capacity by 50,000,000 pounds annually above the 1940 output. This increase was requested by the Office of Production Management in the United States and by the Canadian government. Company officials stated they believed the increased output of nickel could be achieved by the expenditure of $29,000,000 to the end of 1943 followed by further capital expenditure on plant and equipment and other enlargements to the end of 1945 to make a total of $34,000,000.

Industrial Spirit Pervading the Dominion

■ **Typical of scenes throughout industrial Canada, this photo shows a skilled workman setting up automatic gear cutter on war work. Members of American Society of Tool Engineers, following recent convention in Toronto, have commented approvingly upon remarkable number of ably handled modern machine tools which they saw in 12 great arms and munitions plants in the Dominion. NEA photo from Office of Director of Public Information, Ottawa**

Now-and-After Plan; Fuller Says "It Must Be Sold"

■ BROAD program of planning for the post-war period as well as for the present emergency was urged by Walter D. Fuller, president, National Association of Manufacturers, before the Advertising Club of Pittsburgh last week.

Mr. Fuller advocated "selling" the American system of free enterprise to the public, for "What does it gain us to save the world from totalitarianism if we cultivate totalitarianism at home?"

Expressing confidence that America can win the post-war crisis by production and selling, Mr. Fuller proposed the following:

"1—Produce to the utmost for defense.

"2—Produce to the utmost for civilian needs.

"3—Have faith in the future, faith in the power of free enterprise, faith in the strength of advertising and selling and prove it.

"4—Apply all the lessons learned in this emergency to reduce unit manufacturing costs for the future.

"5—That, in increasing efficiency of operation and increasing markets, we find ways to increase payrolls. The American people will always be American business and industry's best customers.

"6—Pioneer selling as we have pioneered production. We have never sold or consumed all that we could produce. As business and industry do this 'better' economic job then thoughtful people will concern themselves more with broad economic problems, and executives and workers together will find ways to do things rather than seek reasons against change and new ideas.

"7—Broad surveys of post-war possibilities must be undertaken.

"8—Not again lose sight of the fact that the American public must everlastingly be kept informed about free enterprise. It is important that America be told what industry is doing, what the various companies are doing, what the problems are and how they are being met. No one else is going to sell free enterprise for us—that is our job."

A major threat to our production program at present, said Mr. Fuller, is the lackadaisical labor policy of the government and the attitude of some labor union leaders. Recent strikes in defense industries have raised the question as to whether we are to have "union security" or "national security."

"Let government announce a strong national labor policy embodying the following points, and the wave of strikes will subside:

"1—No effort should be made by either employers nor employes to use the present emergency for the purpose of changing bargaining relationships.

"2—The right of any citizen to work on defense work will be protected whether he belongs to a union or not, and when men quit work, the employer will be permitted to replace them with men willing to work.

"3—Before there is a strike in defense industries every avenue of conciliation must be used, and the strike must be approved in a secret ballot by a majority of the employes.

"4—Announce that mediation boards and conciliators will refuse to bring pressure upon employers to accept the closed shop or any similar demand forcing employes to join organizations against their desires.

"5—Announce that mediation boards and conciliators will not recommend that employers compromise on wage demands that will cause higher costs and prices."

■ **FENCES FOR DEFENSE: Left, workman dismantles iron railings in Hyde Park, London, to provide metal for arms manufacture. An estimated 100 tons of railings are being removed from the royal parks. Right, railings of St. Clement Danes, historic London church bombed recently, are removed and rushed to "the war foundries". Associated Press and Acme photos**

STEEL

New Deal's New-World "Symphony"

■ AMONG the government agencies which are studying postwar problems is the Bureau of Labor Statistics of the Department of Labor. At the request of Congress it is co-operating with the National Resources Planning Board in studying postwar economic conditions.

A glimpse of how these agencies are approaching the problem is afforded in an address by Dal Hitchcock of the bureau presented at the recent meeting of the American Trade Association Executives.

In appraising the outlook for employment after the war, Mr. Hitchcock presented this glowing word picture:

"The next economic frontier, and one beyond which lies greater room for expansion than would be offered by even another gigantic automobile industry, is the frontier that today needlessly impoverishes the under-privileged third or half or two-thirds of our population.

"These people can be drawn to work in the business enterprises of the nation and throughout the world where the need for expansion is far greater than here, working at wages that they will willingly spend to buy the very things they make.

"In America and in the democracies of the world after the war, we are determined, you men in business, the men and women of labor, we in Washington, that it shall be done."

• • •

And how, one may ask, is this world-wide abundant life going to be achieved?

By national financial management. Mr. Hitchcock explains it simply in these words:

"When we no longer need the materials of war, government can continue to balance the income flow so that full employment can be sustained in private enterprise and in private enterprise alone—if business itself will understand and do its job; but if business is going to misunderstand, is going to oppose the management of income flow, yes even oppose deficit spending when it is needed, then the lesson the public will have learned will be dangerous indeed. It may well mean the destruction of democracy and private enterprise."

• • •

If we understand the quoted passages correctly, the planners for whom Mr. Hitchcock speaks are envisioning a super New Deal experiment on a world scale to be launched at the end of the war. The nerve center of the planned economy will be national financial management—to control the flow and distribution of income—and the prime mover of the project will be deficit spending.

To all intents and purposes this is simply the old spend-lend theory dressed up for a postwar world performance.

Congress treated the administration's spend-lend bill pretty roughly several years ago. We doubt if the American public will look with favor upon extending an experiment which failed at home to world wide application after the war.

Postwar planning might better be devoted to saving the nation from bankruptcy and to shifting the trend of government away from totalitarian concepts and back toward the principles of democracy.

Without financial security and freedom, social gains are worthless.

E. L. Shaner

EDITOR-IN-CHIEF

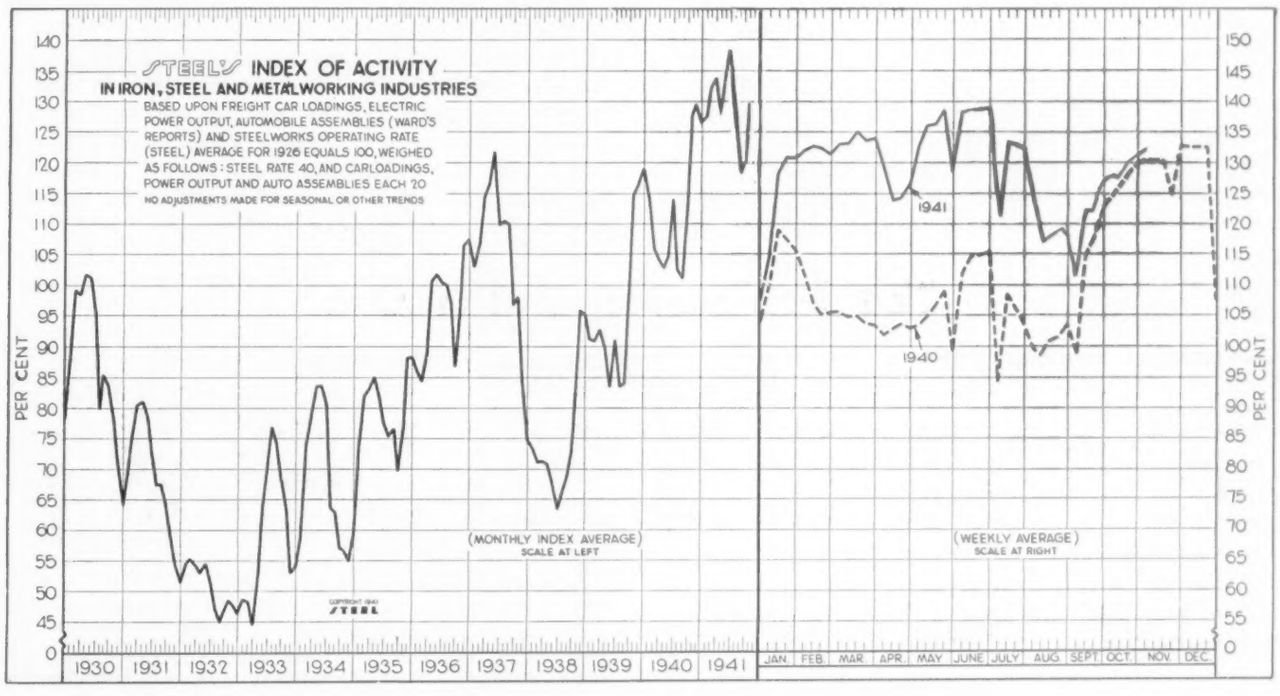
Nov. 10, 1941

The *BUSINESS TREND*

Industrial Output Holds At Near Record Level

■ INTERRUPTION of defense production resulting from a growing number of strikes featured October. The United States Department of Labor reports that the number of workers striking for organization has fallen from 74.7 per cent of the total involved in labor disputes, as recorded last January, to about 35 per cent of the total. Over this same period disputes originating over wages rose to about 65 per cent of the total, from 25 per cent as reported in January. The department also states that in September the total number of new strikes was at a monthly peak, with the exception of the sitdowns in the spring of 1937.

At the close of October industrial production was generally unchanged, with the rising trend of defense activity largely offsetting the spreading curtailment in civilian industries. To what extent expanding defense production over the coming months can take up the slack resulting from declining consumers' goods output remains to be seen. OPM charts show 175,000 plants, or 51 per cent of the nation's productive facilities, will be working on defense by late 1942. Only


STEEL'S INDEX OF ACTIVITY
IN IRON, STEEL AND METALWORKING INDUSTRIES
BASED UPON FREIGHT CAR LOADINGS, ELECTRIC POWER OUTPUT, AUTOMOBILE ASSEMBLIES (WARD'S REPORTS) AND STEELWORKS OPERATING RATE (STEEL) AVERAGE FOR 1926 EQUALS 100, WEIGHED AS FOLLOWS: STEEL RATE 40, AND CARLOADINGS, POWER OUTPUT AND AUTO ASSEMBLIES EACH 20
NO ADJUSTMENTS MADE FOR SEASONAL OR OTHER TRENDS
PER CENT
(MONTHLY INDEX AVERAGE) SCALE AT LEFT
(WEEKLY AVERAGE) SCALE AT RIGHT
1941
1940
1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.

STEEL'S index of activity gained 0.5 point to 131.9 in the week ended Nov. 1:

Week Ended	1941	1940
Aug. 16	118.2	100.8
Aug. 23	118.5	101.4
Aug. 30	118.2	103.5
Sept. 6	111.8	98.7
Sept. 13	122.3	114.9
Sept. 20	122.9	124.4
Sept. 27	127.5	122.8
Oct. 4	128.0	124.4
Oct. 11	127.9	126.0
Oct. 18	130.2	128.3
Oct. 25	131.4	129.9
Nov. 1	131.9	130.2

Mo. Data	1941	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930
Jan.	127.3	114.7	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1	87.6
Feb.	132.3	105.8	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5	99.2
March	133.9	104.1	92.6	71.2	114.4	87.7	83.1	78.9	44.5	54.2	80.4	98.6
April	127.2	102.7	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0	101.7
May	134.8	104.6	83.4	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.6	101.2
June	138.7	114.1	90.9	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1	95.8
July	128.7	102.4	83.5	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3	79.9
Aug.	118.1	101.1	83.9	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4	85.4
Sept.	121.1	113.5	98.0	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3	88.7
Oct.	129.9	127.8	114.9	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2	78.8
Nov.	129.5	116.2	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4	71.0	
Dec.	126.3	118.9	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3	64.3	

12,000 plants are so engaged now. To ease the conversion of 163,000 more, legislation is being drafted to liberalize contract-awarding provisions.

Inventories increased for the third consecutive month during September, according to the Department of Commerce. In contrast with August, when the accumulations were heavily concentrated in the metal fabricating and defense industries, the September rise was widely distributed over both the durable and nondurable goods industries. Inventories increased about $300,000,000 during September, as the departments

Where Business Stands

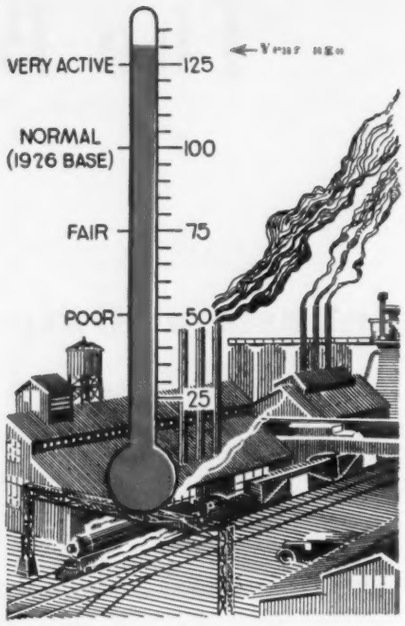
Monthly Averages, 1940 =100

	Sept., 1941	Aug., 1941	Sept., 1940
Steel Ingot Output	124.3	123.3	110.4
Pig Iron Output	122.9	120.5	108.6
Building Construction	186.8	227.8	104.2
Auto Output	63.6	42.1	72.8
Freight Movement	126.6	128.4	112.1
Wholesale Prices	116.9	115.3	99.4

Industrial Weather

TREND:

Sidewise



index moved from 134.4 to 137.3. In the same period last year the index was 112.2.

The National Industrial Conference Board states order backlogs during September declined for the first time since March, 1940. Increased shipments and lower volume of new orders combined to bring this result. Volume of new orders receded for the second consecutive month, the board reports. Spreading scarcity of raw materials and the necessity of having to hold high priority ratings has forced numerous civilian goods manufacturers out of the market.

STEEL's index of activity in the iron, steel and metalworking industry averaged 129.9 during October, up 8.8 points from the September average and was also above the 128.7 recorded during July. In October, 1940 the index averaged 127.8.

For the week ended Nov. 1 the index rose to 131.9 compared with 131.4 the preceding period and 130.2 in corresponding week last year. The weekly index is currently well below the peak of 138.8 recorded during the period ended June 28.

The national steel rate held steady at 95.5 during the week ended Nov. 1, despite curtailed operations at Pittsburgh due to strike of the captive coal mines. Reflecting resumption of production at these mines steel operations advanced last week. Automobile assemblies again increased to reach the highest level for the current model production.

The Barometer of Business

Industrial Indicators

	Sept., 1941	Aug., 1941	Sept., 1940
Pig iron output (daily average, tons)	157,510	154,343	139,085
Iron and steel scrap consumption (tons)	4,392,000	4,518,000	3,876,000
Gear Sales Index	243	276	183
Foundry equipment new order index	363.8	312.9	161.2
Finished steel shipments (Net tons)	1,664,227	1,753,665	1,392,838
Ingot output (average weekly; net tons)	1,593,389	1,580,351	1,415,011
Dodge bldg. awards in 37 states ($ Valuation)	$623,292,000	$760,233,000	$347,651,000
Automobile output	248,751	164,792	284,583
Coal output, tons	45,464,000	43,300,000	38,650,000
Business failures; number	735	954	976
Business failures; liabilities	$9,393,000	$11,134,000	$11,397,000
Nat'l. Ind. Conf. board (25 industries, factory):			
Av. wkly. hrs. per worker†	41.2	41.0	38.5
Av. weekly earnings†	$34.10	$33.70	$28.58
Cement production, bbls.	16,115,000	16,345,000	13,105,000
Cotton consumption, bales	875,682	874,113	638,235
Car loadings (weekly av.)	884,793	897,848	783,833

†August, July and August respectively.

Foreign Trade

	Aug., 1941	July, 1941	Aug., 1940
Exports	$455,257,000	$358,649,000	$349,928,000
Imports	$282,513,000	$277,847,000	$220,217,000
Gold exports	$6,000	$13,000	$10,000
Gold imports	$36,979,000	$37,055,000	$351,563,000

Financial Indicators

	Sept., 1941	Aug., 1941	Sept., 1940
30 Industrial Stocks†	127.35	127.57	131.46
20 Rail stocks†	29.28	29.60	28.43
15 Utility stocks†	18.62	18.48	22.18
40 Bonds ($1,000,000)	$53.22	$54.36	$49.24
Bank clear'gs (Daily ave.)	$1,092,324	$1,043,274	$878,470
Commercial paper rate (N. Y., per cent)	½–⅝	½–⅝	½–⅝
*Com'l. loans (000 omitted)	$11,024	$10,903	$8,785
Federal Reserve ratio (per cent)	91.2	91.0	89.6
Capital flotations:			
New Capital‡	$64,856,000	$360,284,000	$113,250,000
Refunding‡	$208,544,000	$110,444,000	$118,944,000
Federal Gross debt (millions of dollars)	$51,346	$49,513	$44,075
Railroad earnings	$104,070,310	$110,016,367	$74,715,435
Stock sales, New York stock exchange	13,546,161	10,874,650	11,940,000
Bond sales, par value ($1,000,000)	$141.0	$140.3	$126.4

‡August, July and August respectively.
*Leading member banks Federal Reserve System.
†Dow-Jones Series.

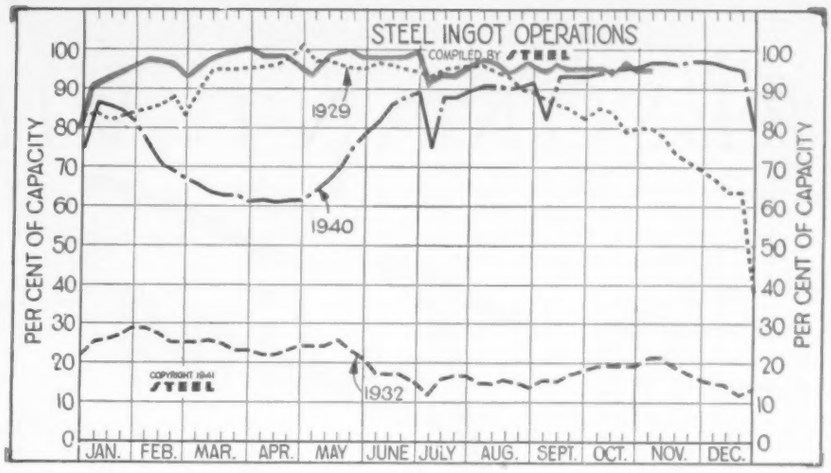
Commodity Prices

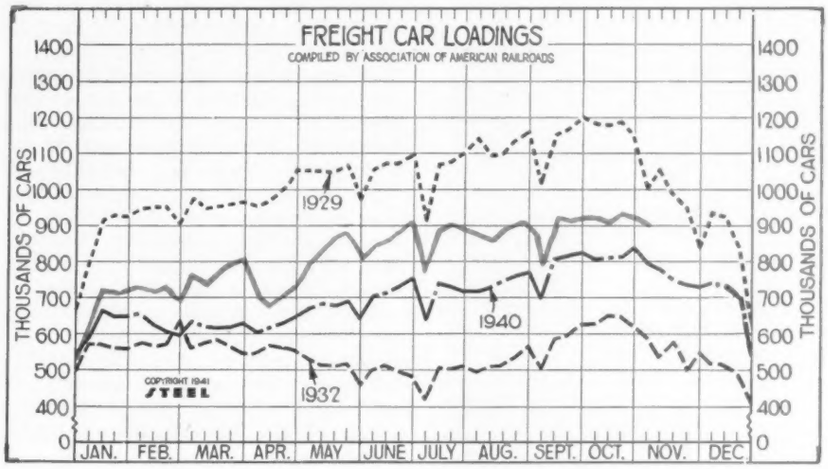
	Sept., 1941	Aug., 1941	Sept., 1940
STEEL's composite average of 25 iron & steel prices	$38.15	$38.15	$37.93
U. S. Bureau of Labor's index	91.8	90.3	78.0
Wheat, cash (bushel)	$1.17	$1.14	$0.80
Corn, cash (bushel)	$0.815	$0.845	$0.625

Steel Ingot Operations

(Per Cent)

Week ended	1941	1940	1939	1938
Nov. 1....	95.5	96.5	93.0	57.5
Oct. 25....	95.5	95.5	92.0	54.5
Oct. 18....	96.5	95.0	91.0	51.5
Oct. 11....	94.5	94.5	89.5	51.5
Oct. 4....	96.0	93.5	87.5	48.5
Sept. 27....	96.0	93.0	84.0	47.0
Sept. 20....	96.0	93.0	79.5	48.0
Sept. 13....	96.5	93.0	74.0	46.0
Sept. 6....	95.5	82.0	62.0	41.5
Aug. 30....	96.5	91.5	64.0	44.5
Aug. 23....	96.0	90.5	63.5	43.5
Aug. 16....	95.5	90.0	63.5	41.5
Aug. 9....	96.0	90.5	62.0	40.0
Aug. 2....	97.5	90.5	60.0	40.0
July 26....	96.0	89.5	60.0	37.0
July 19....	95.0	88.0	56.5	36.0
July 12....	95.0	88.0	50.5	32.0





Freight Car Loadings

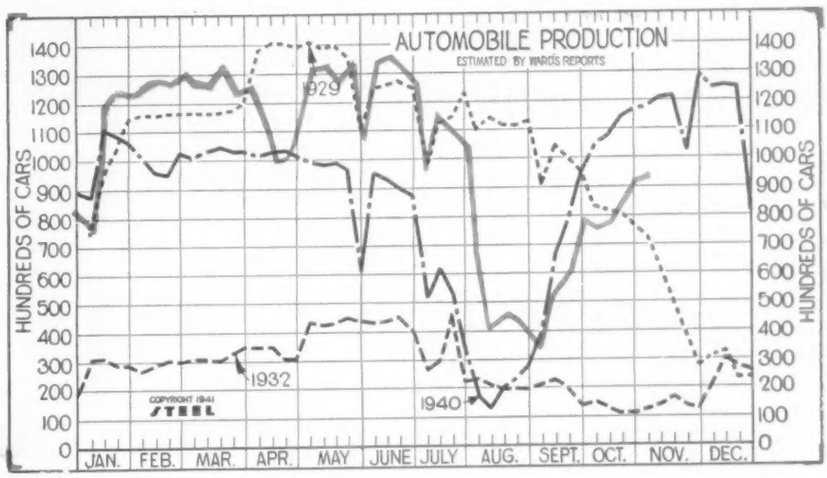
(1000 Cars)

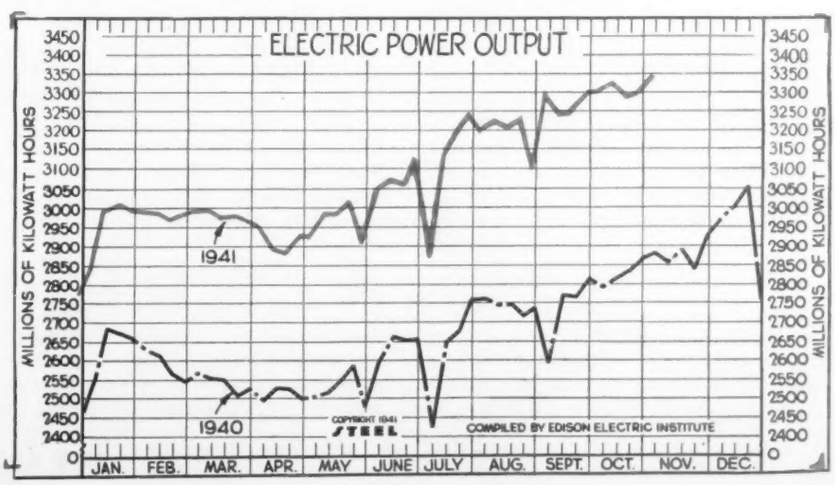
Week ended	1941	1940	1939	1938
Nov. 1.....	895	795	806	709
Oct. 25.....	914	838	834	709
Oct. 18.....	923	814	861	706
Oct. 11.....	904	812	845	727
Oct. 4.....	918	806	835	703
Sept. 27.....	920	822	835	698
Sept. 20.....	908	813	815	676
Sept. 13.....	914	804	806	660
Sept. 6.....	798	695	667	569
Aug. 30.....	912	769	722	648
Aug. 23.....	900	761	689	621
Aug. 16.....	890	743	674	598
Aug. 9.....	879	727	665	590
Aug. 2.....	883	718	661	584
July 26.....	897	718	660	589
July 19.....	899	730	656	581
July 12.....	876	740	674	602

Auto Production

(1000 Units)

Week ended	1941	1940	1939	1938
Nov. 1....	92.9	118.1	82.7	80.0
Oct. 25....	91.9	117.1	78.2	73.3
Oct. 18....	85.6	114.7	70.1	68.4
Oct. 11....	79.1	108.0	75.9	50 5
Oct. 4....	76.8	105.2	76.1	37.7
Sept. 27....	78.5	96.0	62.8	25.4
Sept. 20....	60.6	78.8	54.0	20.4
Sept. 13....	53.2	66.6	41.2	16.1
Sept. 6....	32.9	39.7	26.9	17.5
Aug. 30....	40.0	27.6	25.2	22.2
Aug. 23....	45.5	23.7	17.5	18.7
Aug. 16 ...	45.6	20.5	13.0	23.9
Aug. 9....	41.8	12.6	24.9	13.8
Aug. 2....	62.1	17.4	28.3	14.8
July 26....	105.6	34.8	40.6	30.4
July 19....	109.9	53.0	47.4	32.1
July 12....	114.3	65.2	61.6	42.0




ELECTRIC POWER OUTPUT
MILLIONS OF KILOWATT HOURS
1941
1940
COPYRIGHT 1941 STEEL
COMPILED BY EDISON ELECTRIC INSTITUTE
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.

Electric Power Output

†

(Million KWH)

Week ended	1941	1940	1939	1938
Nov. 1.....	3,339	2,882	2,609	2,271
Oct. 25.....	3,299	2,867	2,622	2,284
Oct. 18.....	3,273	2,838	2,576	2,281
Oct. 11.....	3,315	2,817	2,584	2,251
Oct. 4.....	3,290	2,792	2,554	2,229
Sept. 27.....	3,233	2,816	2,559	2,208
Sept. 20.....	3,232	2,769	2,538	2,211
Sept. 13.....	3,281	2,773	2,532	2,279
Sept. 6.....	3,096	2,592	2,376	2,110
Aug. 30.....	3,224	2,736	2,442	2,217
Aug. 23.....	2,193	2,714	2,434	2,202
Aug. 16.....	3,201	2,746	2,454	2,207
Aug. 9.....	3,196	2,743	2,414	2,198

†New series: Includes additional governmental and power generation not previously reported.

RESONANT VIBRATION Testing

By DR. R. O. FEHR
General Engineering Laboratories
And
CARL SCHABTACH
Turbine Engineering Department
General Electric Co.
Schenectady, N. Y.

. . . . . using powerful new electromagnetic exciters extends scope of fatigue testing into many important new fields and aids the designer to avoid or minimize vibration of machine elements

■ THE IMPORTANCE of the vibration characteristics of machine elements has increased greatly in recent years because of the increased speed and refined design of modern machines. Although careful design and construction will reduce or eliminate many of the forces causing vibration, it is often necessary, in addition, to make sure that the natural vibration frequency of any of the machine elements does not correspond to the frequency of any forces remaining; for if it did, such a condition of resonance would result in large vibrations being built up by very small disturbing forces. Thus resonance in machines is something that must be carefully guarded against.

It is also necessary for the designer to know the vibration resistance or fatigue strength of the materials from which parts are made so their ability to withstand unavoidable vibrations may be evaluated accurately.

These essential vibration characteristics—natural frequency and fatigue strength—are conveniently determined by vibrating actual machine elements or material specimens. Magnetic excitation of such vibrations has become increasingly popular for a number of reasons.

The equipment employed is compact and easy to use; it can be adjusted to vibrate the work at any frequency throughout an extremely wide range; there is practically no limit as to size and shape of the specimen; and since there need be no mechanical connection, the actual vibration frequency of the part being tested is obtained directly.

It is the purpose of this article to show various methods for magnetically exciting mechanical vibrations; to point out their advantages and disadvantages; and to describe some of the applications of such equipment.

Perhaps the principle of magnetic excitation may best be demonstrated by the simple magnetic vibrator shown in Fig. 1. A simple cantilever specimen forms part of an alternating-current magnetic circuit. The alternating flux in the air gap produces a variation in force on the specimen at twice the current frequency. If the natural frequency of the specimen is equal to this frequency (that is, twice the current frequency), the specimen will vibrate vigorously, although the magetic force may be very small compared to that required for an

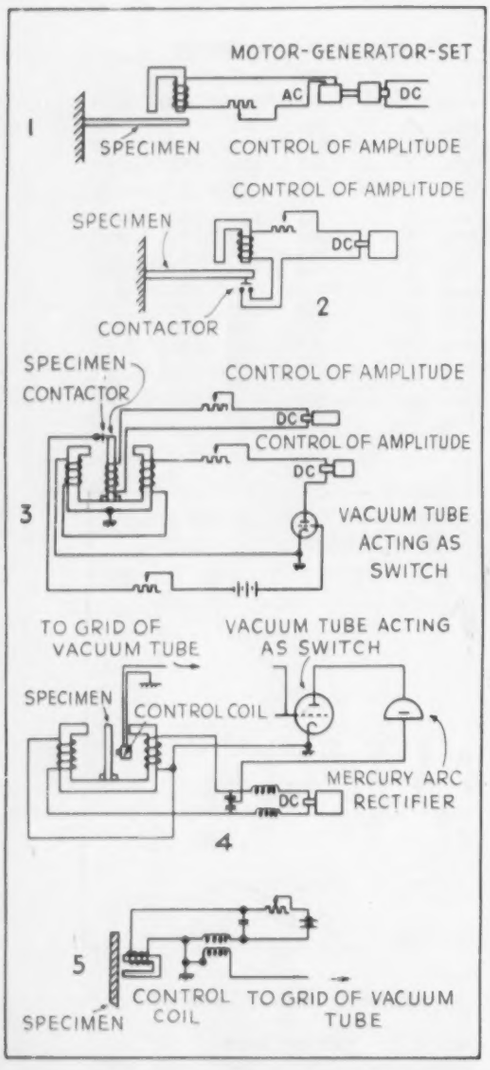


Fig. 1—Simple magnetic vibrator setup employing a variable-speed motor-generator set as source of variable-frequency alternating current

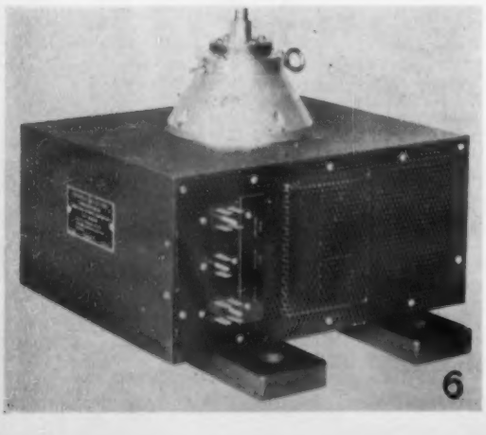
Fig. 2—Make-and-break or "door bell" type of magnetic vibrator. Here natural frequency of the specimen itself determines the frequency of the current in the energizing coil

Fig. 3—Improvement on Fig. 2 setup. Here specimen contact does not control energizing current directly but merely actuates vacuum-tube switch, thus getting reasonable contact life and allowing good operation at frequencies up to 150 cycles per second. This arrangement has been used successfully for 20 years

Fig. 4—This variation of Fig. 3 requires no coil over the specimen; uses no mechanical switch, but a magnetic control coil instead. In this arrangement, the energizing alternating current is imposed on the direct-current magnetizing current. A filter arrangement prevents alternating current from being fed into the direct-current supply line

Fig. 5—This is the control coil circuit used with the vacuum tube switch in Fig. 4. It has none of the short life and speed limitations of the mechanical switch

Fig. 6—Vibration motor is driven by reaction of constant flux (produced by direct-current field coil) with varying flux from alternating-current coil placed in that field. Efficiency of electrical to mechanical conversion of energy is exceptionally high



equal vibration at any other frequency.

On the basis of this phenomenon, we may set down the requirements which such equipment must satisfy to accomplish the objectives given above.

First, to determine natural frequencies, the frequency of the alternating current should be adjustable continuously over a wide range. The specimen frequency then is determined from the current frequency which produces the most vigorous vibration.

Second, to determine fatigue strength, provision must be made to maintain the specimen in vibration at constant amplitude, preferably at its natural frequency. Since the natural frequency of the specimen changes during progress of the test, it is desirable that means be provided so the current frequency may be controlled by the specimen frequency.

Frequency Range Limited

The first requirement is easily satisfied by supplying the magnet of Fig. 1 with current from a motor-generator set, varying the alternating-current frequency by changing the speed of the direct-current motor. Such equipment has been in use for many years and still is used for moderate frequencies. However, the equipment is rather cumbersome. Neither can the frequencies be controlled closely nor changed rapidly because of the time required to accelerate the rotating masses. Also, the frequency range is limited by the speed range of the motor-generator set.

To satisfy the second requirement, that is, to keep current frequency equal to specimen frequency, some sort of feed-back is added to the arrangement shown in Fig. 1. This feed-back may be mechanical or electrical, or a combination of the two. A simple mechanical arrangement is a make-and-break device similar to that used in door bells and shown in Fig. 2. The specimen is started by plucking and is maintained in vibration by the intermittent magnetic attraction which pulls it toward the maget until the specimen breaks the circuit by opening the contactor. The specimen snaps back elastically, the current is re-established, and the cycle repeats.

This arrangement has many disadvantages and limitations regarding production of force and control of frequency. The solid specimen offers a high resistance to the passage of alternating flux, especially at high frequencies, hence this limits the force, which is proportional to the flux density in the air gap. Further, the problem of the control of frequency is not very well solved in this scheme since life of the contacts is short even with a condenser connected across them, and such a contact arrangement is not suited for small amplitudes or high frequencies.

Fig. 3 shows an improved design which overcomes some of these limitations. A third coil, energized by direct current, is placed over the specimen. This superposes a direct-current flux on the alternating-current flux in the air gap with the result that the force which acts on the specimen is now proportional to four times the product of the direct-current flux and the alternating-current flux. Thus the same force may be obtained by using a small alternating-current flux and a large direct-current flux, the resistance of the specimen to the passage of direct-current flux being relatively small. The frequency of vibration equals the frequency of the alternating current, while in the scheme shown in Fig. 1, the frequency of the force was equal to double the current frequency.

Instead of a motor-generator set, the disadvantages of which have been mentioned above, a mercury-arc rectifier tube is used for power supply. A vacuum tube acting as a switch permits the use of a very small current through the mechani cal contact which controls the frequency and this, together with the smaller alternating-current flux requirement, increases the life of the contact.

This arrangement has been used for testing material specimens and small machine elements of the cantilever type for 20 years in the General Electric Co., with which the authors are associated. Fatigue tests at frequencies up to 150 cycles per second have been conducted satisfactorily.

However, since it is not always possible to place a coil over the specimen, the circuit shown in Fig. 4 was developed. This is operated in the same way as the one shown in Fig. 3, but does away with the third coil. Capacitors and chokes prevent interference between alternating-current and direct-current power supply. To get rid of the limitations imposed by the mechanical switch, the latter may be replaced by a magnetic control coil. A voltage is induced in the coil, which in turn controls the current through the vacuum tube and also the current in the exciter coils. The circuit in which the control coil is connected is shown in Fig. 5.

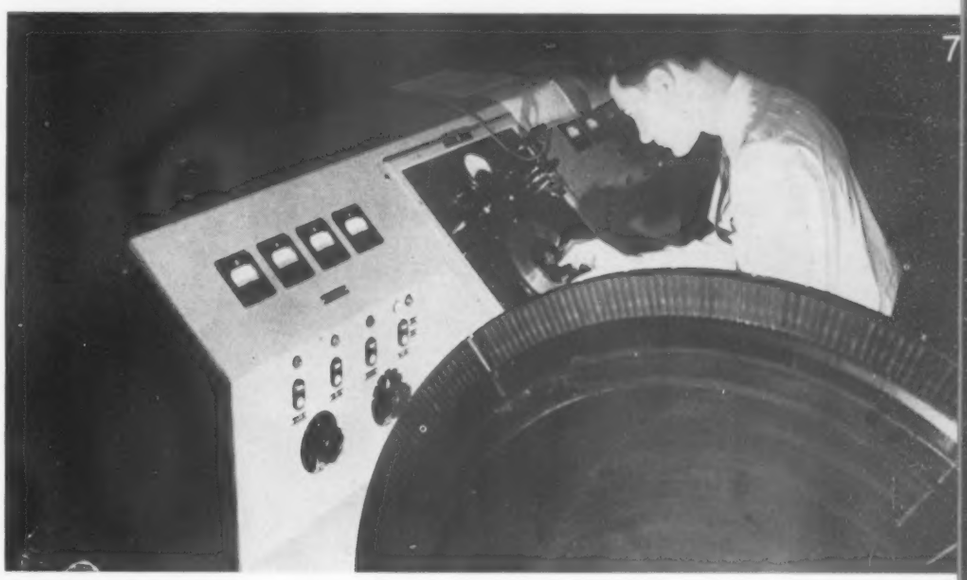


Fig. 7—Variable-frequency alternating current for driving the vibration motor is obtained from this special unit. It contains a variable beat-frequency oscillator in center panel, 100-watt amplifier in left section and 1000-watt amplifier in right section. Unit output is 1000 watts at any frequency between 60 and 20,000 cycles per second

The magnetic exciters mentioned above use the forces in the air gap of a magnetic structure to excite the specimen. Since the air gap has to be rather large in order to allow for motion of the specimen, a rather large stray flux cannot be avoided. The stray flux may be further increased by the high reluctance of the solid specimen at high frequencies with a consequent reduction in the efficiency with which the electrical energy is transformed into mechanical energy. Better efficiency is obtained by application of a so-called vibration motor.

The vibration motor, Fig. 6, is an over-dimensioned dynamic loudspeaker containing a magnetic structure through which a constant direct-current flux passes. This flux

(*Please turn to Page* 96)

The THOMPSON Sub-machine GUN

The background of Brig. Gen. John T. Thompson, the inventor, and steps in development of the "Tommy" gun; principles of the action and the part played by the hammer; how gun is lubricated; feeding and ejecting arrangements

This Is Number 37 in a Series on Ordnance and Its Production, Prepared for STEEL *by Professor Macconochie*

By **ARTHUR F. MACCONOCHIE**
Head, Department of Mechanical Engineering
University of Virginia
University Station, Va.
and
Contributing Editor, STEEL

■ THE "Tommy" gun owes its nickname to a member of that family of Thompsons whose name has been interwoven with the military history of the United States since the Civil war. Brig. Gen. John T. Thompson, a graduate of West Point, class of 1883, became the youngest colonel in the United States Army. He was chief ordnance officer for General Shafter's expeditionary forces in the Spanish American war and learned from this experience the necessity for increasing the fire power of the soldier. Thus began his quest for a more efficient small arms weapon. Appointed chief of the Small Arms Division of the Army Ordnance Department, he supervised the development of the Springfield rifle, for many years regarded as supreme in the military field.

On the outbreak of the World war of 1914 to 18, Thompson, recognizing that the problem of the production of military small arms on a vast scale would have to be solved, resigned from the Army and became chief engineer of the Remington Arms Corp. In this capacity he designed and built the great Eddystone plant at Chester, Pa., at one time the largest small arms plant in the world. Under his supervision this plant manufactured large numbers of Enfield rifles for the British and Three-line Berlin rifles for Russia. On the declaration of war on Germany by this country in April, 1917, he re-entered the service, reaching the rank of brigadier general and director of arsenals, in this capacity supervising all small arms production, and receiving the Distinguished Service Medal from Congress as a reward for his services.

Very early in the last war, General Thompson realized that the only practical means of equipping the greatly expanded armies of the United States with small arms was the adaptation of the .303 Enfield to the .30-caliber cartridge manufactured by the United States, and thus utilize existing manufacturing facilities for the continued production of both Springfield and Enfield rifles. By the end of the war, the Eddystone plant was turning out more rifles than all the other plants in the world combined. Thus had the problem of the mass production—and especially *quality* mass production—been successfully solved.

The Blish Principle

Now a mathematician, Capt. John N. Blish, of the United States Navy and one of the great authorities in his field enters the picture of the present development of the Thompson sub-machine gun. It was he who discovered that certain metals, set at particular angles, become alternately adhesive and repellant under alternating high and low pressure, without benefit of any mechanical aids. In 1915 he obtained recognition of his discovery by the Special Capehart Board of Naval Ordnance and subsequently, in collaboration with General Thompson, applied this principle to a self-oiling and self-opening breech closure. Even in this crude state this unit constituted an automatic breech mechanism which was independent of any linkage, pistons or the like—a development which gave promise of eliminating at one stroke the weight and complications of such devices that hitherto had retarded the successful development of automatic small arms.

In 1920 General Thompson retired from the Army and with his distinguished son, Lieut. Col. Marcellus H. Thompson, Captain Blish and Thomas Fortune Ryan, the financier, undertook the development of the Blish principle through the Auto-Ordnance Corp. Experimentation and research were begun at the plant of the Warner & Swasey Co., Cleveland; and eventually around a

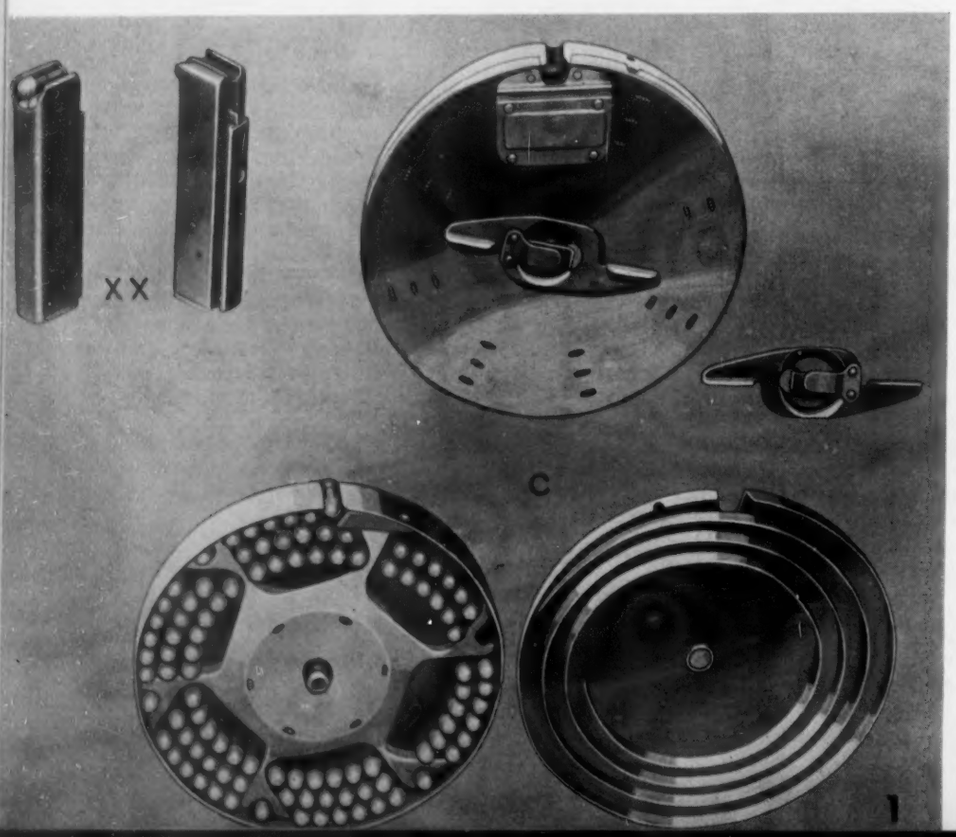


Fig. 1—Box magazine at XX and 100 cartridge drum, assembled and with cover removed at C

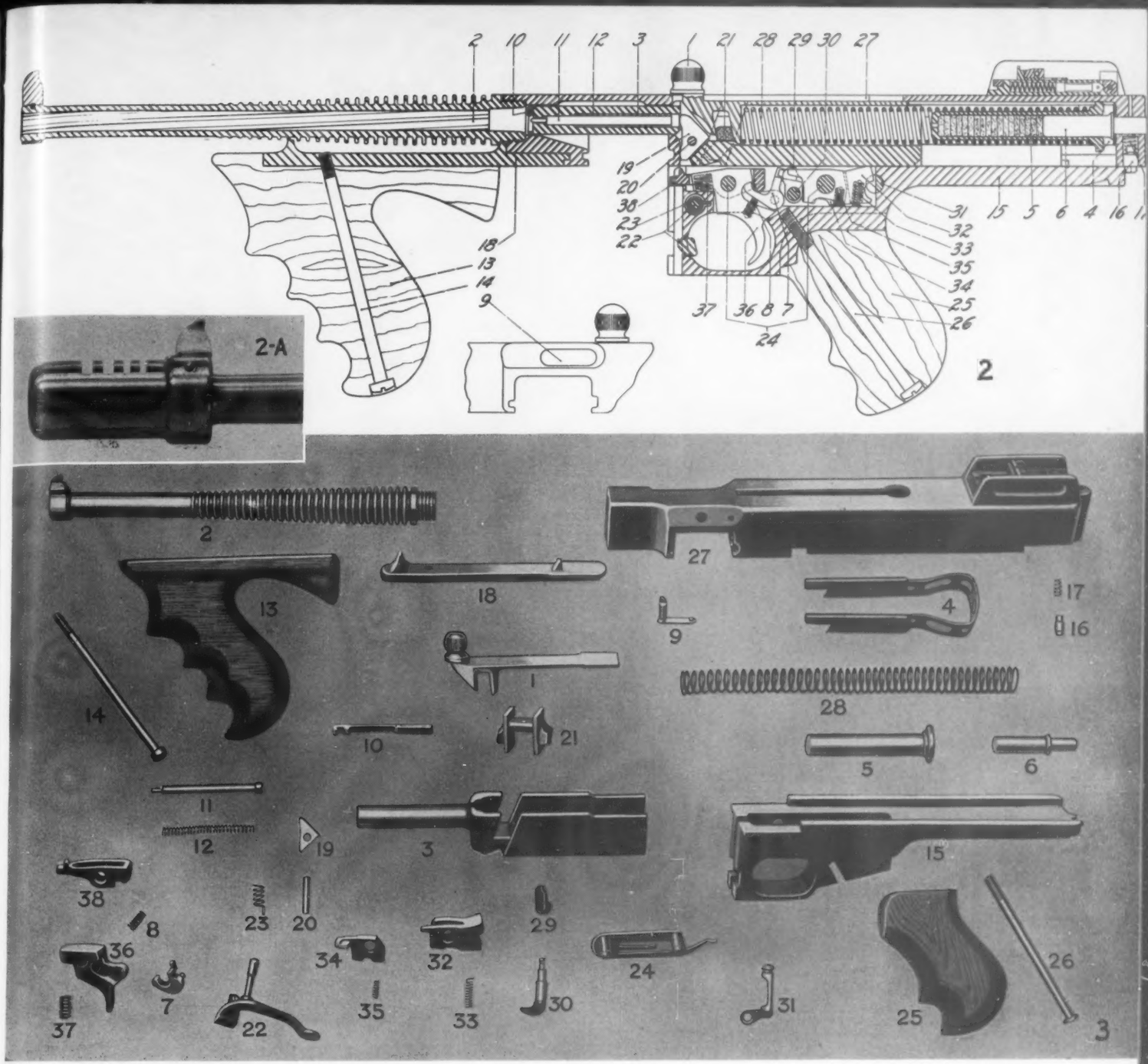


Fig. 2—Sectional view of Thompson sub-machine gun with bolt in closed position and locked. See text for explanation of action

Fig. 2A—This is the Cutts compensator used on the Thompson gun. Powder gases on coming to muzzle are thrown out of orifices upward, compensating for tendency of gun to rise during automatic firing

Fig. 3—Components of Thompson gun. See text for explanation

million dollars spent in patent and development costs. Such is the background of the famous "Tommy" gun.

In 1921, on the order of the Auto-Ordnance Corp., 15,000 basic submachine gun (a term coined by Colonel Thompson) mechanisms were manufactured by the Colt Patent Fire Arms Mfg. Co. at the Hartford plant. Then followed a 10-year period of test in many countries for reliability and tactical utility, eventually resulting in the use of the gun by the United States Navy, Coast Guard, Marine Corps and the Bureau of Investigation of the Department of Justice; and also by a number of foreign governments.

Referring to Figs. 2 and 3, the skeleton of the gun is indicated by number 27: to this is screwed the barrel 2. The bolt 3 consists of a hollow rectangular rear part, and a cylindrical forward portion which fits into the well in the fore part of the receiver. The clearance left for the box magazine, or for the more familiar drum type, is readily apparent. The lock 21 has an H section with side lugs which engage with grooves in the receiver.

When the gun is in action, the explosive pressure of the cartridge (being transmitted through the bolt to the contact surfaces of lock and receiver) results in movement of these inclined surfaces only after a change in their coefficient of friction has taken place, following a large drop in chamber pressure. The angle of the lock is so chosen that unlocking takes place at that point where sufficient pressure remains to perform all the necessary functions of the operating mechanism, including the ejection of the empty cartridge, the compression of the recoil spring and the preparation of the bolt for another cycle.

The hammer of the gun is indicated by number 19. Free to rotate about the pin 20, it strikes the abutment of the receiver slightly ahead

This analysis of the Thompson sub-machine gun has been submitted to and released for publication by the United States War Department.

Fig. 4—Members of the Oxford Light Infantry in coastal command exercises in the north of Ireland—landing party storming the coast uses "Tommy" guns

Fig. 5—Members of the United States 501st Parachute Battalion in full field regalia which includes "Tommy" guns

of the bolt, and so hammers the firing pin at precisely the correct moment of bolt closure. The "actuator" consists of the operating knob and rear portion which slides in the bolt. It has two fingers which engage the crossbar of the lock. It also provides for the seating of the recoil spring. The buffer serves as an arbor for the recoil spring, the rear flange functioning as a buffer abutment for the rear end of the bolt.

The lubricating arrangements of the mechanism include the breech oiler 4, made of spring steel and holding oil saturated felt pads, together with suitable channels in the receiver. The principal function of these pads is to maintain oil films on the lugs of the lock and so control the variation in coefficient of friction between them and the cam surfaces of the receiver; but they also serve to lubricate the sliding surfaces of the bolt. Clearly, with each shot, injection of lubricant will take place.

On the return of the bolt under impulse from the coil spring, a cartridge is fed from the magazine into the chamber. As the bolt nears the end of its stroke, the lugs on the lock engage the front surfaces of the receiver locking grooves which, under spring pressure on the lock via the actuator, cam the lock downwards into the locked position. After discharge, the spent cartridge is ejected through an opening in the right side of the receiver by means of the extractor 10, secured in the bolt by an undercut and limited in its horizontal movement by a stud. The extractor is retained in the bolt under its own spring tension.

The opposite side of the receiver is provided with an ejector 9, secured in position by a projection on the end of a leaf spring engaging with a detent on the receiver. The ejector extends into the path of the bolt (a slot being provided for clearance) and so kicks the cartridge through the gap in the side of the receiver, as the bolt flies rearward. The receiver is latched to the frame at its rear end by the frame latch 16 and spring 17. The parts thus far discussed constitute the receiver assembly. See Figs. 2 or 3 for parts references above.

Frame 15 houses the entire trigger mechanism. It also furnishes a seat for the rear grip and means of attaching the magazine. Of principal interest in this group is the sear 32 which engages one of the sear notches in the bolt when the latter is fully retracted. The trigger 36 is mounted in the frame ahead of the sear and carries the disconnector 7 on a pin passing through its tail. The spring 8 pushes the disconnector steadily against the sear 32. The spring 37 tends to rotate the trigger to its normal position of release. Embracing the upper part of the trigger and mounted on the same axis, the trip 38 extends forward into the path of the follower in the box magazine and so, when the last shot is fired, the trip rises and moves the disconnector 7 away from the sear lever 34. Thus the sear is permitted to engage the notch in the bolt and hold it "open." This sear lever lies between the sear and the disconnector and is mounted on the sear pin. It is pushed down by the sear lever spring 35.

If the action be considered carefully, it will be seen that when the trigger is pulled, the disconnector moves upwards, lifting the sear lever. Thus, in turn, the forward projection of the sear is raised and its rear depressed, releasing the bolt. As long, therefore, as the trigger is held, the bolt continues to reciprocate in automatic action until either the magazine is empty, or the trigger is released.

In order to secure semi-automatic fire, another device comes into play. Situated between the trigger and the sear is a rocker 29 mounted on an eccentric pivot. This rocker clears the bolt when the gun is set for automatic fire, but when the rocker pivot is rotated through a half circle, it projects upwards into a slot in the bolt which terminates at such a point that when the bolt nears the end of its forward stroke, the rear extremity of the slot strikes the rocker and causes it to throw the disconnector forward. This action disengages the disconnector from the sear lever. Under the impulse of the sear lever spring, the sear lever now assumes its normal position, leaving the sear free to engage the bolt in its retracted position.

The safety itself 31 consists of a pin having its central portion milled out to permit the sear freedom of movement. By rotating this pin, it may be made to engage a semi-circular notch in the sear, thus positively locking the bolt in the retracted position with the sear engaged in the notch.

The box type magazine of the Thompson gun, shown in Fig. 1, follows a familiar pattern in which the cartridges are staggered in a vertical bank. The dovetail projection at the rear serves the double purpose of engagement with the frame and of providing a path for the rear projection of the follower which makes contact with the trip after the last shot in the magazine has been fired. The drum magazine, also shown in Fig. 1, is provided with a spiral path in both the body and the cover, around which the train of cartridges are driven by radial fingers, mounted between the two halves of the path. These fingers (which are driven by a spring motor) are so constructed that they intercept equal sectors of the spiral train in all rows. If this were not done, of course, the cartridges would not be held tightly in their axial positions as movement took place to-

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wards the periphery of the drum. The spring motor is wound up with a key secured to the end of the hub, rotation in the wrong direction being prevented by a ratchet.

The "Tommy" gun is capable of firing more than 600 shots a minute, in the hands of a trained soldier. It appears in high favor with the British, as shown by Fig. 4, p. 70, which shows members of the Oxford Light Infantry in coastal command exercises in the north of Ireland, affecting a landing. British troops are using it effectively in Libya and, in the hands of the defenders of British airports, it awaits the threatened "blitz" of the "tight little island." Both China and the Dutch East Indies have a high regard for its capabilities in "jungle" fighting; while we here in the United States are providing two or more Tommy guns as an essential part of the armament of every tank. Motorcyclists and parachutists are also being so equipped, as in Fig. 5, p. 70, which exhibits members of the United States 501st Parachute Battalion in full field regalia.

How To Do More . . . . .

with what you have

York Ice Machinery Corp., York, Pa., has developed a plan for running its sheet metal shop that has increased production, decreased supervision required by 20 per cent, decreased time required for setting rates by 28 per cent, cut inspection time by 25 per cent, simplified planning and obtained many other important benefits. The plan appears to have wide range of application

■ FOLLOWING are not merely someone's ideas or theories, but are results actually being obtained in the sheet metal shop of York Ice Machinery Corp., York, Pa., as told recently by H. L. Consley, assistant works manager, in a talk before the American Management Association. This shop is not what would be termed a big production shop, nor is it entirely a jobbing shop. It is someplace between these two with some fairly good production jobs, some slightly repetitive jobs and some individual jobs that never repeat.

This shop now employs 150 to 200 men in the manufacture of sheet metal work used in the construction of air conditioners, air washers, coolers, condensers and other similar equipment. A large portion of the products is used directly by the Army and Navy.

Through shop drawings, transfer of skill, specialization of work and better planning and control, it has been possible to increase production, decrease time used in teaching men, cut inspection time and increase incentive coverage. The plan that makes this possible is here detailed step by step.

At one time the accepted procedure was to furnish engineering drawings to sheet metal workers who used the usual run of equipment found in sheet metal shops such as shears, brakes, presses, spot welders, etc. At the start of the analysis there were three things that stood out for consideration as possible sources of improvement. These were drawings, sheet metal workers and manufacturing equipment.

The last item was eliminated from consideration immediately because more equipment would mean an additional outlay and increased overhead, would take buildings to house it, and they in turn would increase the investment and require a certain period to construct. Likewise it was found impossible to secure equipment in a reasonable length of time if at all.

Next, attention was focused on the sheet metal worker himself, a highly skilled workman.

Bearing in mind that we were working from engineering drawings, it first was attempted to set out in black and white the things that the sheet metal worker actually did. The result was surprising, not only as regards the number but the importance of the jobs being done. This analysis resulted in dividing the record of the sheet metal worker's activities into eight sections as follows:

Layout: Here the worker must be able to visualize a solid shape as a plane surface; be able to apply plane and solid geometry; be familiar with application of allowances in measuring stretch and crawl of metal and general metal performance; and be able to determine the economical use of material including the ability to judge where to put seams, the ability to figure the number of seams versus size of sheet as well as figuring the cost extras on size of sheet.

Joint Design and Construction: For this portion of the job, the worker must be familiar with size and spacing of rivets, number of spot welds per foot of seam, various types of welds including beam weld as well as procedure for calking, soldering, brazing and the factors entering into design of joints with these operations.

Sequence: The sheet metal worker also must be able to select the operations to be formed, then fix the sequence of these operations so they do not interfere with each other in manufacturing the completed part.

Equipment: Worker must be able to select size and capacity of shear, brakes, etc., for the particular operations; be familiar with tools, dies and their particular applications; be familiar with multiple and single punch work and be able to select equipment best suited for each particular operation.

Planning: A fifth section involves planning the work. Here it is necessary to write a bill of material in form of material requisition, secure the material, collect the tools, get shipping date and then schedule the operations.

Setup: With the job planned, it is necessary to equip the brakes, presses, etc., with dies, punches, bar stops, templets, etc., for the specific job at hand.

Seventh section of the job is being able to operate any or all of the tools in the shop.

Eight is the assembly. The operator must be able to rivet, spot weld, bolt, solder, calk, test, tag and forward to shipping department or to other shop departments.

The above analysis brought the realization that the problem is one of transferring skill and specialization of jobs. It thus became evident at once that to do this some record must be made of the skill for each job so that lower skilled men could do the work. This meant that the shop must be furnished with:

(*Please turn to Page* 114)

Abstracted from *Supervision.*

A Quarter of a Century

The illustration is that of a 225 year old hour-glass originally brought from Scotland and used by the early settlers of New England—now exhibited in the Museum of the Western Reserve Historical Society at Cleveland, Ohio.

Casts its Shadow

Twenty-five years of commerce, as the sands alone record, really isn't uncommon. The pronouncement usually comes with the attainment of some degree of mastery, service or distinction accredited during that span of years . . . Lee Spring commemorates a *silver* anniversary—not alone from a time element—but because of a growth attributed largely to the single factor—QUALITY . . . And Lee shall cope with this factor to carry on toward a still greater longevity.

LEE SPRING COMPANY, INC.
30 MAIN STREET BROOKLYN, N. Y.

LEE-BUILT TRADE MARK SPRINGS

NEW FORCED-CONVECTION FURNACE

.... heat treats aluminum and magnesium castings. Panel construction speeds erection, permits relocation, facilitates future expansion

■ A NEW type of heat treating furnace construction that fits well into the needs of the defense program demanding speedy fabrications, rapid installations and dependable accurate performance has been announced by the Despatch Oven Co., Minneapolis. The accompanying illustration shows one of three of these new type units being installed at the National Bronze & Aluminum Foundry Co., Cleveland. This furnace is used for heat treatment of aluminum alloy castings including aircraft engine blocks, tank rear axle and transmission cases, aircraft engine oil pans, turbine wheels, fans and fan parts gas manifolds, bomb turret castings, diesel engine frames, diesel crank shaft housings and hundreds of other items.

While this particular furnace is ideal for the solution heat treatment and aging treatment of aluminum alloy castings and shapes which are being required in increasing quantities, it is also highly recommended for tempering and drawing of alloy steels, normalizing and stress relieving of castings and welded sections, and numerous other heat treating processes requiring a temperature range up to 1200 degrees Fahr.

Inside working dimensions of this furnace are 7 feet wide, 8 feet high and 15 feet long. Overall dimensions are 10 feet wide, 16 feet long and 9 feet high, not including the heater equipment on top of the furnace. Total height is 21 feet.

Approximately 5000 to 7000 pounds of aluminum castings are placed on the car as shown. Net load capacity is 10,000 pounds. Through a special gear rack system on the car, it can be quickly run into the furnace after loading. Here the parts are solution heat treated or precipitation heat treated for the required length of time at the temperature needed to produce maximum tensile strength and elongation factors.

Due to the reduction in hardness and yield strength of the alloys at heat-treating temperatures, it is necessary to use special frames with adjustable contact points to create proper tension, also to prevent the overhanging parts of the castings from warping or sagging out of shape. When running large castings, in many instances large quantities of smaller castings can be nested within the larger pieces. When loading large quantities of small castings, these are not piled more than two or three high due to the danger of distortion while hot.

After heat treating the furnace door is opened and the electrically operated car moved out. Next the parts are quenched. By arranging all of the remote control push buttons for the lift door and the loading car close together, it is simple for the operator to control positively and easily the loading and unloading operations.

With large furnaces such as this, heavy racks divided into sections work out to better advantage from the quenching standpoint. After the car is moved out of the hot furnace, the crane man hooks into the first rack or basket. Then he swings this rack or basket into the quench tank and returns the car with the second rack or basket into the furnace and closes the door until the temperature control indicates that the alloy castings are back to operating temperatures.

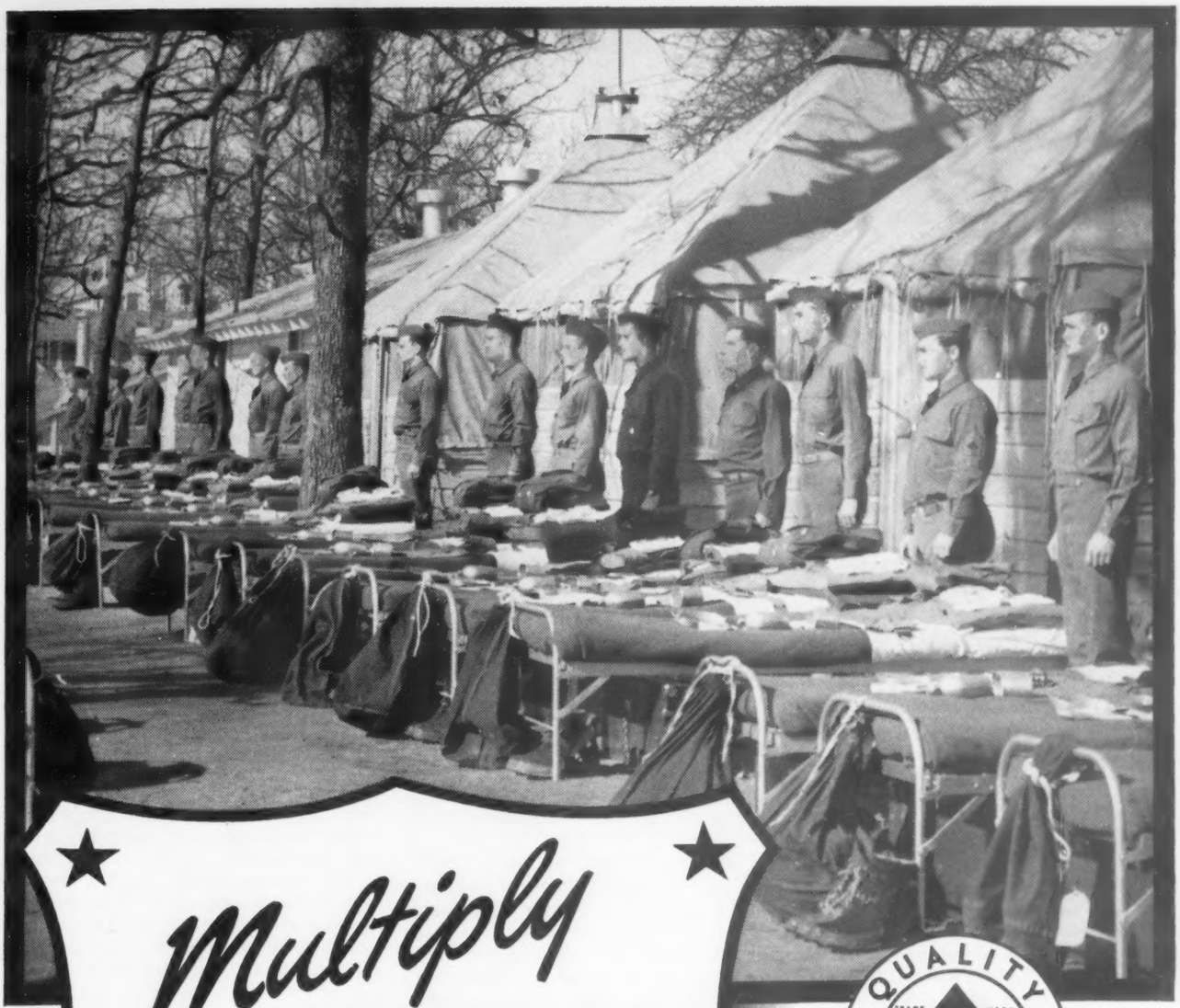
In the meantime the rack or basket of castings has been allowed to remain in the quench tank about 15 or 20 minutes and is ready to be removed. Then it is unloaded and reloaded for another charge. By this time the next rack is ready for removal from the furnace car and the operation is repeated until the furnace car is entirely empty.

When large diesel crankcase castings which run the full length of the furnace car are heat treated, the entire car must be unloaded at one time due to the tremendous size of the castings. Even when loading these larger castings, however, many other small castings are placed on the car in and around the larger castings, thereby increasing the net load per charge.

This furnace uses an entirely new type of furnace body construction. Instead of the customary refractory or insulating brick construction, specially designed panels are employed. The interior wall of the furnace panel is 18-8 stainless steel while the exterior of the panel is heavy 16-gage steel. Between the walls there is 8 inches of high grade insulation to keep heat loses at a minimum.

(*Please turn to Page* 111)

One of three new heat-treating units being installed at National Bronze & Aluminum Foundry Co., Cleveland. Note the overhead monorail bridge and hoist to load racks on car platform and to remove quickly for insertion of work into nearby quench tanks



Multiply by 127,272

To make the eleven army cots you see here requires 128 feet of steel tubing, 195 feet of angle steel, 1073 feet of spring wire and 1933 feet of galvanized wire - not to mention rivets and other small pieces of steel.

Multiply these figures for 11 men by 127,272 and you have the amount of steel fabricated into beds for our new army of 1,400,000 men - a total of 451 million feet of material - 33,367 tons of steel.

Such an essential item as beds for soldiers is just one of the many defense uses for which much of the regular production of Youngstown mills is going now. This, of course, is in addition to the ever-increasing tonnage of special steels produced for armament.

Day and night, our plants are working to deliver every ton of steel possible.

25-27D

QUALITY TRADE MARK YOUNGSTOWN SERVICE

Youngstown products include Pipe and Tubular Products - Sheets - Plates - Conduit - Bars - Tin Plate - Rods - Wire - Nails - Tie Plates and Spikes

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SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yoloy Steels

General Offices - YOUNGSTOWN, OHIO

ADVERTISING PAGES REMOVED

How To Get the Most from

ARC WELDING

—Section VIII—

By E. W. P. SMITH
Consulting Engineer
The Lincoln Electric Co.
Cleveland

As Mr. Smith points out, you can see inside of the joint while it is being made. This permits the man who knows what to look for to tell whether or not all welding conditions are correct, assurance of a good weld

■ WE HEAR the statement, "You don't know what is inside of the weld and the only way you can tell is to break it. Then you have to weld it all over again!" Those who make such statements forget that you can see *the inside of the joint while it is being made.* The welded joint is the only type of which this is true.

Then there is the question of the human element, personal element, whatever you wish to call it. Is there any operation, any fabrication process which does not involve a personal element? With the ability to see and know what you are doing, there is absolutely *no excuse* for poor welds. There may be *reasons* for them such as poor steel, wrong kind of electrode, wrong technique, or something of that sort, but there can be no excuse or alibi. A properly made weld *must come out right.*

There are a number of methods of inspection of arc welding. Of these various methods the simplest, of course, is that of visual inspection. A man of experience and good observation can arrive at conclusions which are satisfactory when using the visual inspection method.

It's really quite a simple matter to learn how to judge the characteristics of a weld. In saying this, we assume that the setup is correct—that the operator is using the right polarity, current, arc length and speed, and that a good machine and good electrodes are being used. The problem under discussion, therefore, concerns only the variables over which the operator has control—that is, the human element.

How then can you check these variables? However, there are but four things that should be watched:

1. The burn-off of the electrode.
2. The fusion and penetration.
3. The forming of the bead on the work.
4. The sound of the arc.

These four tell-tale signs indicate to the operator just what is going on in the arc. If the signs are as they should be, the weld is certain to be sound.

In regard to penetration and fusion, a word of explanation may be necessary. Fusion is the melting and joining of the metal. Penetration is the depth to which the parent metal is penetrated or melted by the heat of the arc. Proper penetration means that the parent metal is melted to a degree sufficient to result in all of the weld metal deposited being clean and of good quality but that no more metal is melted than is absolutely necessary to get good fusion. With proper penetration you ordinarily get good fusion.

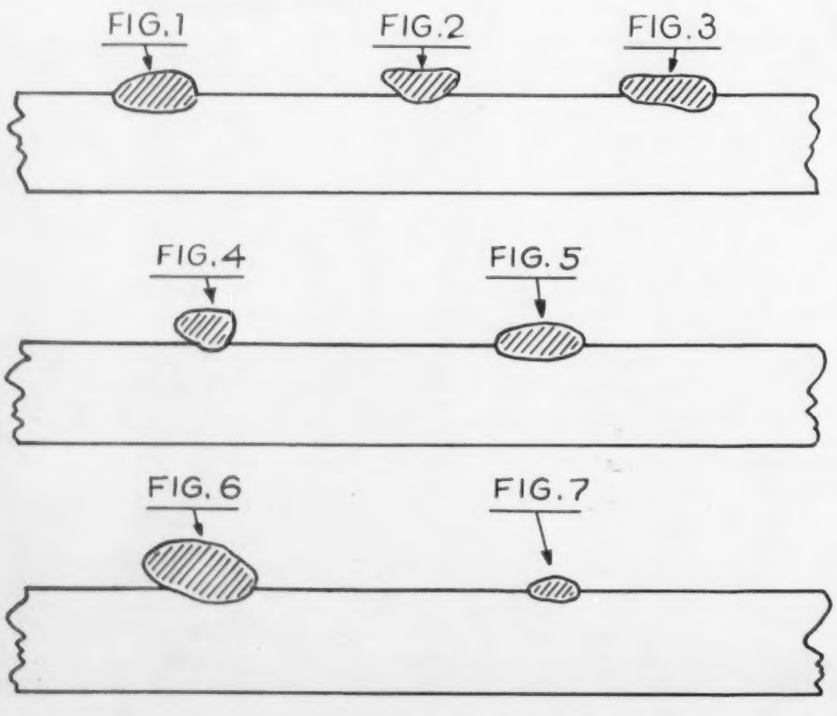
The way to study by visual inspection is to vary only one of three factors—current, voltage and arc speed—at a time and then become familiar with the effect of the variation of that one factor.

When normal polarity is used together with proper current, arc length and speed of travel, the sound of the arc is a sharp, consistent crackling, the crater is deep, the bead is smooth without overlapping, and there is good fusion of the weld metal and parent metal. See Fig. 1.

Suppose too low a current is used. The arc sound pulsates slightly, the bead piles up and overlaps, while the crater is shallow. The bead will have the appearance shown in Fig. 2.

If the current is too high, the

Fig. 1—A properly made weld. Fig. 2—The effect of using too small a current. Fig. 3—Porous, flat bead as well as excessive penetration and a deep crater result from too high a current setting. Fig. 4—If the arc voltage is too low, the bead piles up. Fig. 5—Excessive voltage at the arc results in a flat bead. Fig. 6—If the operator travels the arc at too slow a speed, the bead piles up and rolls over. Fig. 7—When the arc is moved along too fast, little or no penetration occurs. The result is just a surface deposit, not a weld. Parts so joined are merely "stuck" together as there is no real strength in such a joint



arc sound resembles a steady crackling noise with explosions, while weld metal splatters about and the electrode becomes red hot throughout its entire length. It will be noted, too, that there is too much penetration and that the crater is excessively deep. The bead will appear porous and flat as in Fig. 3, p. 74.

When the voltage across the arc is low—that is, when the arc is too short—the sound is steady, the bead piles up and the crater is quite shallow. See Fig. 4. An extremely short arc may cause the electrode to freeze to the work.

If the voltage is high (long arc), the arc produces a whistling or hissing sound, plus some crackling. Weld metal splatters and little penetration is obtained. The bead is almost flat as in Fig. 5, p. 74. Too long an arc is readily noticeable due to these characteristics and to the bubble that forms on the end of the electrode. It will be noticed that the weld metal is oxidized.

Too slow a speed of travel causes the arc to sputter, and the rod to become red at the tip. The bead will pile up and roll over. See Fig. 6. The crater will be deep, and the weld will take on a bluish tinge.

Little penetration quickly identifies the weld laid with the arc traveling too rapidly. The bead is ragged and uneven because the parent metal has not been melted. The result is not a weld but merely the deposit of electrode metal on the surface of the base metal. See Fig. 7, p. 74.

Now if the operator will use the correct current, voltage and speed of travel but reverse the polarity—that is, have the work negative and the rod positive—he will find that his weld has all the undesirable characteristics previously pointed out. The arc will pop and sputter, the weld metal will splatter, the bead will be uneven and without penetration. And the crater will be shallow.

A little practice, varying one after another of the components from good welding procedure, will enable the operator to tell instantly whether or not he is producing a good weld—and if not, just what he is doing incorrectly.

For quick reference a tabulation of weld characteristics described above is given in Table I. Note that the resulting weld characteristics shown in the body of the table are those obtained when all variables are normal except the one indicated in the first column at the left.

Inspection *after welding* is done by several methods.

One such method utilizes the stethoscope. By tapping gently along the welded seam with a light hammer and listening with the stethoscope, a change in the sound shows when a fault is reached. It is, of course, necessary that the inspector be trained in the use of a stethoscope so he will note this difference in sound and therefore know when the defect has been located. The equipment is simple and rather inexpensive.

Another important method of inspection after welding involves magnetic principles. If magnetic flux is passed through the weld and the metal adjacent thereto and some iron filings or powder are sifted on the piece, a pattern will be produced that can be interpreted to show the condition of the joint. For the existence of a fault materially changes this pattern, thus affording an indication of the position and extent of the fault.

Another method along the same line is to have the welded joint subjected to magnetic flux and then to check the work with a meter that gives a deflection proportional to this flux. Any variation in the flux caused by a fault in the piece will cause the deflection of the meter to vary. This method has been found especially useful in connection with pipe inspection.

X-ray inspection, of course, is perhaps the best known. It is essentially a shadow process. Any cracks, holes or porosity are indicated on a negative placed on one side of the weld while the source of the rays is placed on the other side.

TABLE I—Resulting Weld Characteristics When Variable Listed in Column 1 is Incorrect

Operating Variables	Arc Sound	Penetration Fusion	Burn-off of Electrode	Appearance of Bead	Comments
Normal polarity, correct current, voltage and speed of travel.	Steady, sharp crackling sound	Good crater averages 1/8" deep for 1/8" rod	Stable	Smooth—no overlaps	
Low current	Pulsating "low energy"	Poor very shallow crater		Bead piles up—overlap	
High current	Explosions crackling	Poor weld characteristics—porosity		Flat	Electrode becomes hot—splatter
Low voltage (across arc)	Steady sputter	Poor crater shallow	Rod apt to freeze to work	High	
High voltage (across arc)	Whistling or hissing and crackling	Very little fusion—shallow crater	Bubble on end of rod—arc wanders	Flat	Splatter pockets in weld—weld oxidizes
Low speed of travel		Crater excessively deep	Piles up and rolls over—bluish color	Electrode becomes red at tip—splatter	
High speed of travel		Almost no crater—no fusion	Irregular in width—flat		
Wrong polarity	Sputter	No crater porosity		Irregular	Spatter

Practice on Nonferrous Range Boilers in Print

■ Printed copies of simplified practice recommendation R181-41, "Nonferrous Range Boilers," are now available according to the Division of Simplified Practice, National Bureau of Standards, Washington. It was proposed recently by the Non-Ferrous Hot Water Tank Manufacturers Association to conserve nonferrous metals by reducing unnecessary inventories of boilers.

Copies of the practice may be obtained from Government Printing Office, for 5 cents each.

Foolproof Crack Test For Crankshafts

■ Because punch-press crankshafts are subjected to tremendous strains in operation, periodic tests are essential.

A test for detecting cracks in crankshafts and which has proved to be quite foolproof is that used at the General Electric Co.'s Schenectady Works—the magnetic test. It consists of magnetizing the shaft, making the direction of the flux longitudinal so that it will intercept any possible cracks at right angles.

While magnetized, the shaft is sprayed with kerosene which has in suspension finely divided particles of magnetic iron oxide. Any cracks or discontinuities in the metal will set up magnetic poles, which, while very slight, are strong enough to attract and hold the iron-oxide particles, outlining cracks which may ordinarily be invisible to the eye.

this OK—

GROWS LOUDER EVERY YEAR

No SAG OR TWIST IN
CS MOTOR FRAMES
8 REASONS WHY YOU SHOULD BUY WESTINGHOUSE INDUCTION MOTORS
We said this and proved it in 1933
350 pounds of metal—hanging 3½ feet out from this 10-hp. motor bearing—and it sagged less than 2/10,000 of an inch!
Westinghouse

Industry approved the one-piece Westinghouse frame in 1933—and likes it better than ever today

"No sag or twist in CS Motor Frames" is an old story by now. We said it in 1933—and proved it by letting a 10-hp motor bearing support 350 pounds, 3½ feet out from the frame.

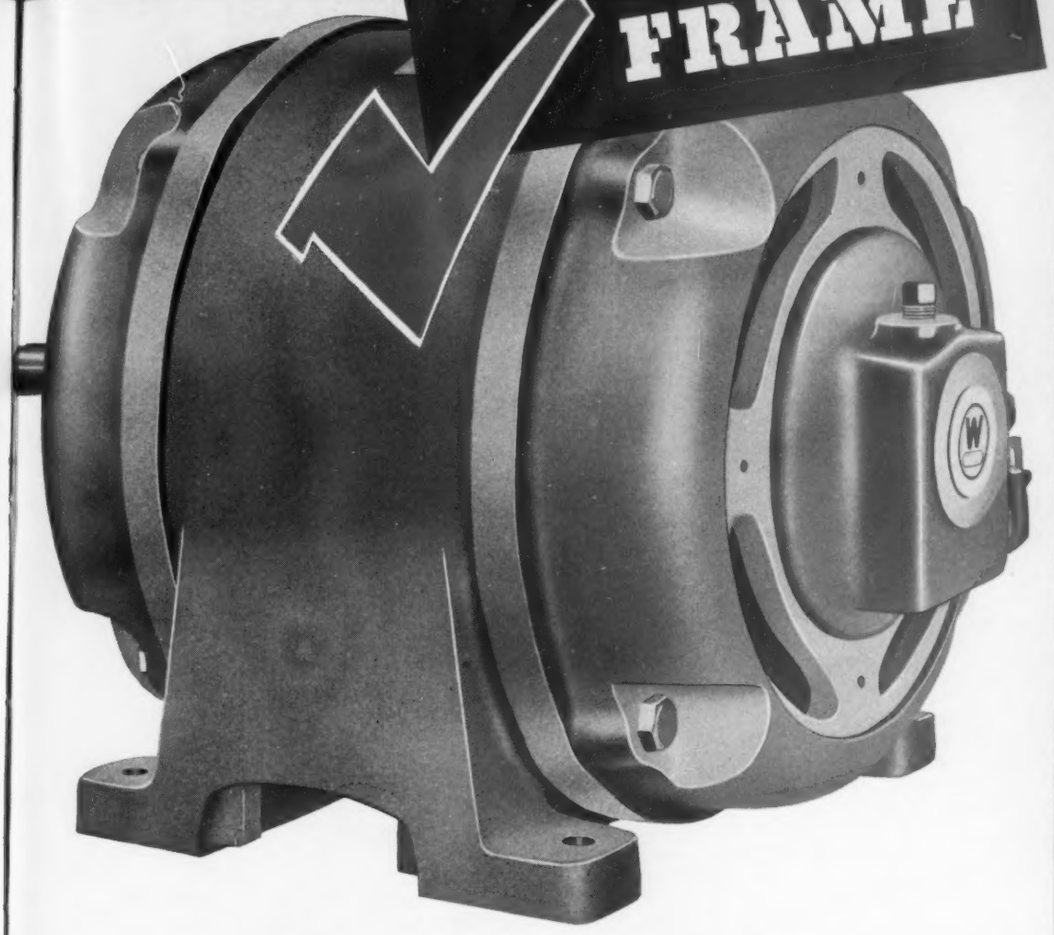
Industry liked the idea then—and ordered CS Motors to get the benefit of a rigid cast frame, along with those other important benefits—sealed-sleeve bearings and Tuffernell insulation.

Industry likes the idea better than ever today—judging by the acceptance of the one-piece cast frame.

When we first announced it over a decade ago, the CS Motor with its cast frame, sealed-sleeve bearings and Tuffernell insulation was a big improvement over previous motor designs. Today, with the years of experience and improvement that have gone into it, it is better than ever.

Westinghouse

ONE PIECE FRAME



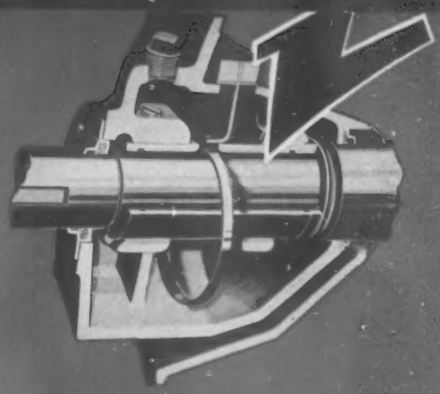
The integrally cast frame on this Westinghouse CS Motor protects the electrical elements fully against twisting strain and vibration.

RENEWAL PARTS AND SERVICE

Not only for current models, but for any Westinghouse Motor or control device ever built, Westinghouse assumes the responsibility of providing renewal parts. They are made with the same tools as the original equipment and to the same rigid standards. Parts are therefore fully interchangeable and maintain the original performance.

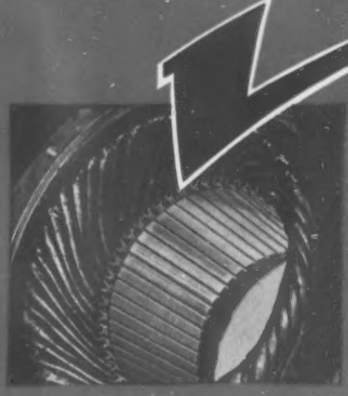
The 34 district manufacturing and repair plants are so located throughout the United States that parts or service are available overnight wherever your plant may be.

J-21175



SEALED-SLEEVE BEARING WITH FELT GASKET AND VESTIBULE SEAL

Oil is sealed in—dirt and dust are sealed out. Only in Westinghouse CS Motors do you get this dual protection.



TUFFERNELL INSULATION

Includes the Westinghouse insulating slot cell, plus taped end turns giving extra strength at the most vulnerable spots. The final dipping and baking completes the protection which resists the abrasive wear of dust, dirt, and grit under the most unfavorable conditions.

HIGH FREQUENCY TEST GIVES EXTRA PROTECTION AGAINST INSULATION FLAWS

In addition to the standard A.I.E.E. tests each Westinghouse motor must pass the Westinghouse Radio Frequency Test—the only test that detects flaws and weak spots between each individual turn of the windings.

Type CS Motors

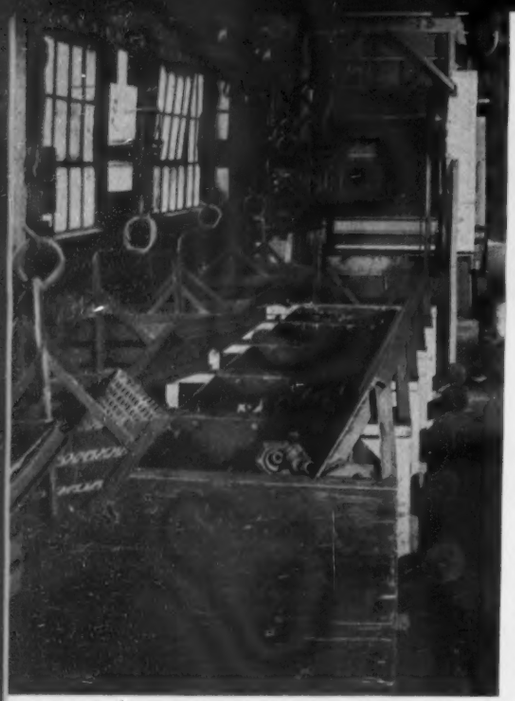


Fig. 1—Operators stand on platform behind bins, sort and throw parts into bins. Cleaning machine operator dumps bins, handles loader and runs cleaning machine. Illustrations supplied by American Foundry Equipment Co., Mishawaka, Ind.

SORTING CASTINGS

. . . . a materials handling problem

■ WHEREVER assorted miscellaneous castings, forgings or other metal parts are sent through an abrasive or shot blasting machine as part of the regular production cycle, it is necessary to work out some method of sorting out similar types of pieces for shipment or further processing.

Sorting, of course, can be done either before or after the cleaning operation but in most instances it is desirable to do the sorting before sending the work through the cleaning machine. The reason is that the cleaning time in the machine may vary greatly for different size, weight, shape and type of objects as well as with the density of the sand, scale or dirt removed during the operation. If the machine is loaded with products with varying cleaning requirements, it is necessary to blast the load a sufficient length of time to clean the most difficult pieces properly. Obviously, part of the load will be overblasted. While this does not damage the pieces, it does increase cleaning costs unnecessarily.

Therefore usual procedure is to manually sort the work to group pieces of the same type. This often is done by placing the assorted pieces on a belt conveyor which travels past a group of stations at which operators remove the various types of work. Or the work may be dumped out on a sorting table and classified by a single operator where quantities are not great. However, in any type of mass production operation, proper attention to the handling problem involved here will be found well worth while.

At the Pontiac Motor Co. plant, Pontiac, Mich., a 48 x 42-inch Wheelabrator Tumblast airless abrasive blast cleaning machine is used to clean a varied production of automobile castings in a wide range of sizes and weights. The items include bearing caps, water pump housings and the like.

Before the present setup was built to handle this work on the most efficient basis, these parts came from the foundry in conveyor baskets and were dumped directly into the loader of the Tumblast. Since several baskets full of castings are required for a full sized load weighing about 1800 pounds, there usually was a varied batch of parts being cleaned simultaneously. Then subsequent sorting of the cleaned work entailed a labor operation which added substantially to the costs of the cleaning department.

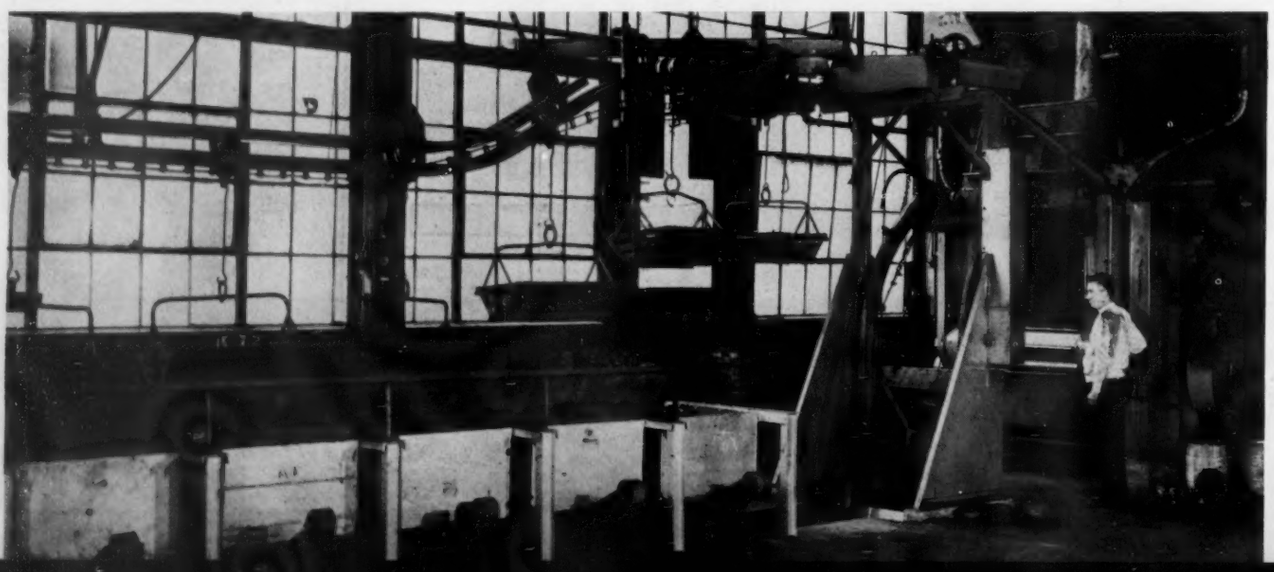
To overcome the disadvantages of this procedure, the following system was worked out for sorting the castings prior to cleaning:

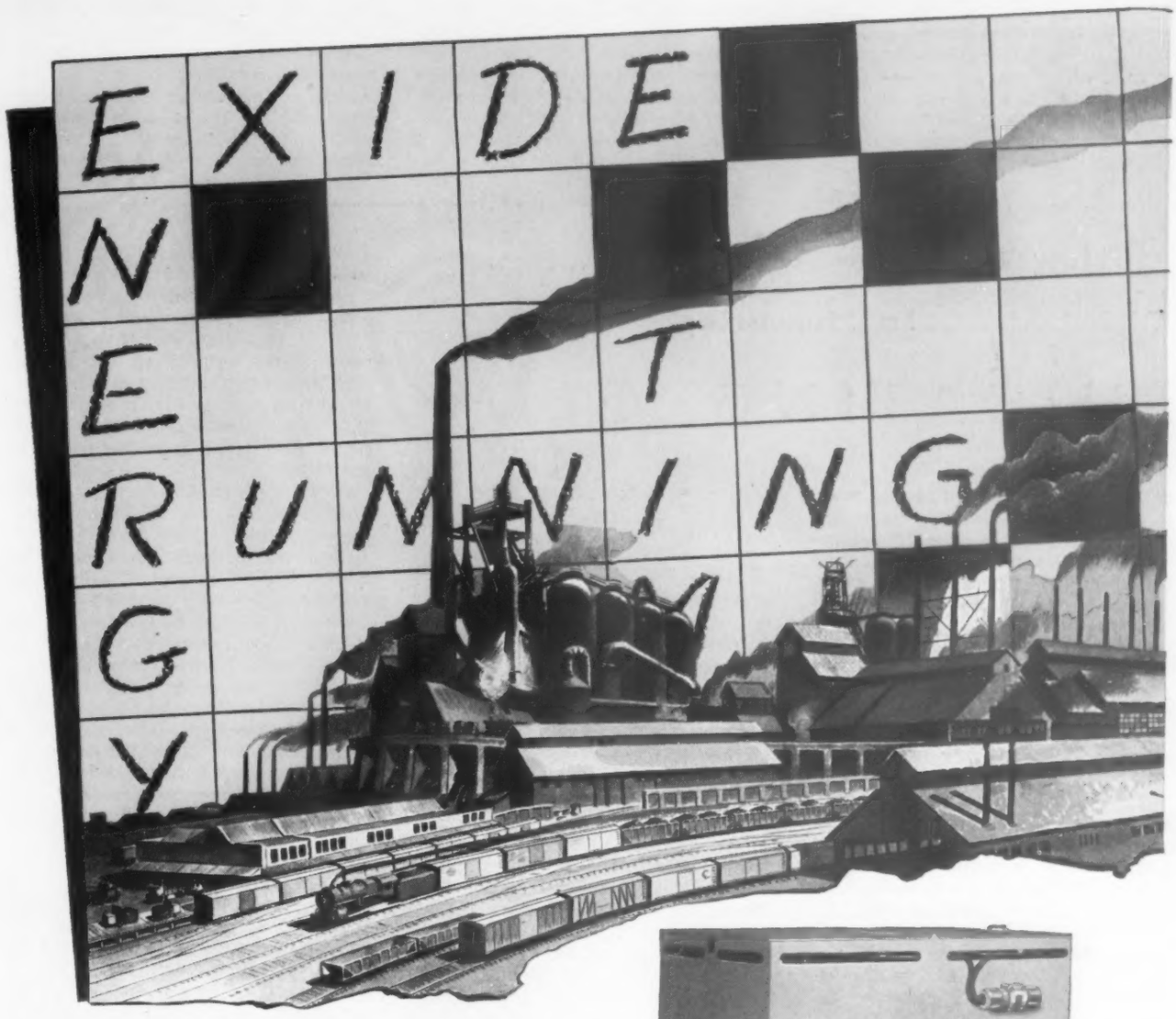
Castings arrive in the cleaning department in cooling baskets which are suspended on an overhead chain conveyor. As shown in the accompanying illustrations, this conveyor is arranged to carry the baskets over a series of five bins which are located in a direct line under the conveyor. Workers stand on a raised platform in back of the bins, from which position they remove castings from the baskets and drop them into the bins—each bin being reserved for a certain type of casting. This platform may be seen at the extreme lower left in Fig. 1. The baskets are spaced apart slightly so it is possible to remove a casting and drop it into its particular bin with little effort.

At this point, the castings are in the different bins, sorted out as to types, sizes, etc. Each bin is provided with a counterweighted door on the bottom. This allows dumping the contents of any bin out onto a vibrating underflow pan conveyor located immediately underneath and in line with all five of the bins.

The pan conveyor discharges into a bucket which is part of the loader device that deposits the work in

Fig. 2—This is the sorting and charging layout feeding the 48 x 42-inch Wheelabrator Tumblast in the cleaning department. The five sorting bins are shown in line at the left underneath the chain conveyor carrying the work in metal cooling baskets from the shakeouts





Exide is a five-letter word for DEPENDABILITY

THAT is the answer if you ask the men in the many steel mills where electric trucks handling steel coils are equipped with *dependable* Exide-Ironclad Batteries.

Now that defense industries need the biggest tonnage of steel you can produce, your handling equipment must operate smoothly, at top speed, without interruptions or delays. Batteries must be full of "go," turn after turn, to keep your electric trucks moving.

That's why Exide today is a five-letter word with a big meaning . . . *dependability* . . . as Exide Batteries, maintained efficiently by the Exide System, work the clock around in steel mills all over the country . . . helping to produce more tonnage . . . to keep America rolling!

Exide
IRONCLAD
BATTERIES

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
Exide Batteries of Canada, Limited, Toronto

the cleaning machine. This loader appears in line with bins at right in Fig. 2, p. 80. It consists of a pair of rails on which the bucket rides as it is pulled to the top or dumping position by a pair of cables running to a motor driven sheave at top of the loader frame.

With this setup, only castings of a certain type are loaded into the cleaning machine at one charge since each bin has sufficient capacity to accommodate enough castings to form a load. With only one type of work being cleaned at a time, the cleaning cycle can be adjusted to give most efficient results for that particular type of work.

Thus this comparatively simple materials handling layout is the means of obtaining much greater efficiency in the cleaning department, and without much expense for elaborate, complicated equipment.

How To Secure Accurate Readings In Measuring

PULSATING FLOW

By **WILLIAM MELAS**
Cochrane Corp.
Philadelphia

■ IN MEASURING pulsating flow, it is generally impossible to obtain readings which are directly proportional to the rate of flow, regardless of what type of flow meter is used. Although precautions can be taken which will reduce the pulsations to only small errors in the readings, accurate readings cannot be taken unless methods are adopted for damping pulsations. Pulsating flow generally is encountered in systems where reciprocating engines, pumps and compressors are used.

The intermittent action of such units creates pressure and velocity waves in the medium, whether it be liquid or gaseous. It is these waves or pulsations which increase the flow meter readings, not because of the oscillation of the pen back and forth on the chart, but because of the inability of the recorder to follow each pulsation accurately.

For example, if the pulsations of flow for a steam flow meter with a maximum capacity of 10,000 pounds per hour were such that at one instant the differential pressure was 48 inches of water and the next instant 3 inches of water, the flow corresponding to 48 inches water head would be 8000 pounds per hour while for 3 inches head it would be 2000 pounds per hour.

The inertia of the fluid in the pressure piping and of the mercury in the instrument prevents the recorder from following the quick changes in differential. The recorder would take a position corresponding to an average differential of 25½ inches, and would thus register 5800 pounds per hour. With the flow for half the time at 8000 pounds per hour, however, and then at 2000 pounds per hour, the actual average flow would be 5000 pounds per hour. Therefore, the pulsating flow would result in the recorder reading 16 per cent high.

The inaccuracy due to pulsating flow may be much greater or much less than the amount given here since the magnitude of error depends upon the frequency and degree of pulsation, the volume and other characteristics of the piping and the compressibility of the fluid. In any case, it is highly important that pulsations be damped or eliminated in order to measure the flow accurately.

A method shown in Fig. 1 enables a flow meter to measure accurately water taken by a reciprocating pump from an open feed water heater or other receptacle having a free water surface. It will be noted that a stand-pipe placed between the pump and orifice is vented back to the heater and absorbs the pulsations created by the pump. While the water level in the standpipe rises and falls, due to the pulsations, the flow through the orifice remains fairly constant and allows the meter to respond to a head corresponding to the average flow.

The vent line from the standpipe leads to the space above the free liquid level in the vessel supplied. Where this is impracticable, the standpipe or chamber may be supplied with compressed air.

When lack of pressure head or other conditions prohibit the orifice being placed on the suction side of the pump, the arrangement illustrated in Fig. 2 can be used. Here the orifice is located on the discharge side.

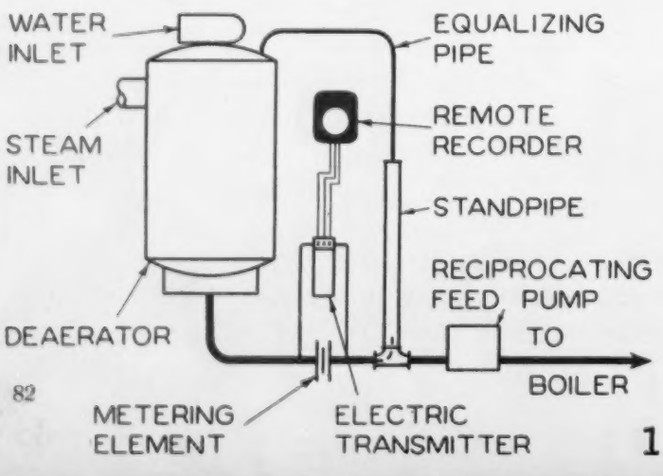
The water is directed upward

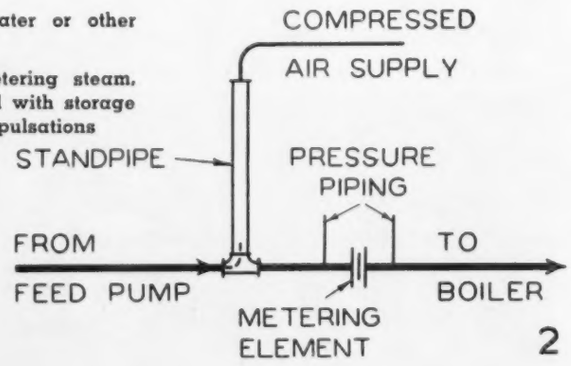
(*Please turn to Page* 115)

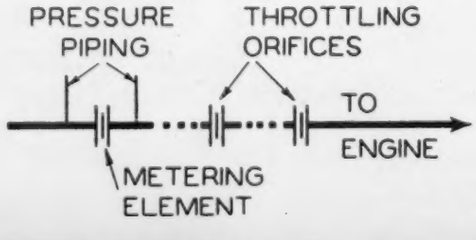
Fig. 1—Method of installing patented Cochrane flow meter in connection with reciprocating boiler feed pump and open heater so that error due to pulsations is eliminated

Fig. 2—Air chamber arrangements for damping pulsations of water or other liquids when orifice is on discharge side of pump

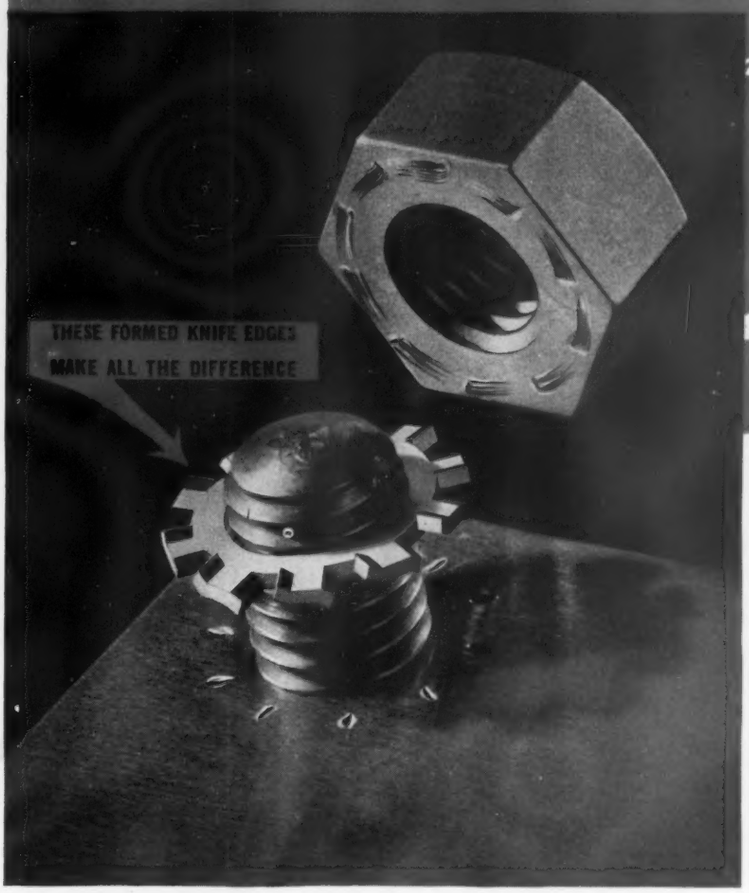
Fig. 3—Use of throttling orifice to damp out pulsations when metering steam, air or gas. The throttling orifices cause a pressure drop in the fluid with storage and restorage in the pipe line and consequent reduction in the pulsations

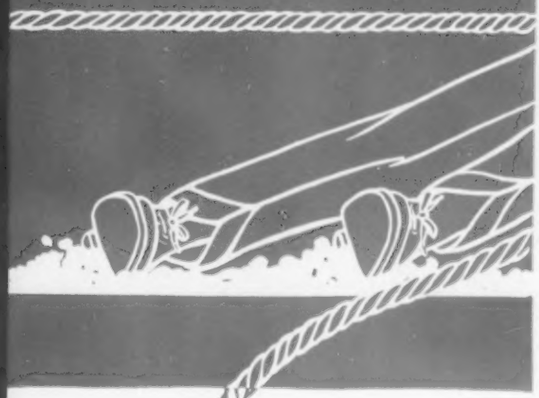






equal to the TUG OF WAR





As the chisel edges of EverLOCK washers dig in to resist the tugs and pulls of vibration or shock, your product proves itself equal to the severest tests. Today, particularly, few manufacturers can foresee exactly how severe the conditions to be met will be. Soundest policy is to bolt or screw every assembly to be ready for the worst.

With EverLOCK washers this is easy and economical — and represents a higher standard of manufacture at no greater cost. The difference is chiefly in the washer design which gives several times more area of resistance (see illustration) with this tooth type washer than with others. The principle is that used by a man who, in a tug of war, braces the whole side of each foot against the earth rather than his heel alone.

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BETWEEN HEATS

WITH *Shorty*

Say fellers:

My 'phone rang the other day 'n when I picked up the receiver a voice at the other end shouts, "Boss, this is Chubby Weir over at the blast furnaces, wantin' to thank y' for okayin' my 'cost above' last month while at the meetin' of the Eastern States and Chicago District Blast Furnace and Coke Oven fellers up at the University club in Cleveland."

"Y' really had a good time, didya Chubby?" I sez.

"Sure did, Boss. Pretty near as good a time as Cliff Wyman had at the banquet tryin' to get the gang to keep their traps shut 'till he could speak 'is piece. But the guys kept on chewin' the rag jus' as though Cliff was runnin' a steam shovel up in the Mesabi district, 'n finally when the boys started singin', Cliff couldn't stand 'er any longer and he starts shoutin', 'Hey youse pig iron makin' fellers, the blowpipes are dropped, we've pulled the tuyeres, the boys are bringin' up the clay to plug 'er tight 'till next year. The meetin's adjourned. She's ADJOURNED. Y' understand?' Good meetin' alright but Boss, you'd better stop around 'till I tellya what some of the fellers are thinkin' 'bout."

"I'll be over a little later, Chubby." 'N I hung up the receiver.

* * *

"Boss, y' know 'Red Miller,' assistant general super down at J & L's plant at Aliquippa, don't y'? Well he sure went to town with 'is paper on 'Air Conditioning' at the meetin'.* He told the fellers 'bout 'is pre-compression system at Aliquippa that keeps the moisture in the air goin' into 'is No. 1 stack 'round 3 grains per cubic foot."

"Was anything said 'bout the post-compression system of air conditioning, Chubbie?"

"Yea, Boss, but not very much. The fellers who lean toward this system plan to take the moisture content down to ¾-grain per cubic foot. They're all waitin' 'til the installation out at Inland Steel get's goin' in a few months so that they can get some definite dope on how the furnace is goin' to act."

"How'd the fellers feel 'bout the two systems?"

"Well, some of the gang liked the pre-compression system of takin' the moisture down to 3 grains before she's compressed; 'n others sorta liked the post-compression system of takin' er down to 3/4-grain after passin' 'er into the turboblowers. Course Red seems to feel that it isn't the grains of moisture that 's the big thing to be gained, but the uniformity in the temperature of the blast, burden, temperature of the iron and the analysis. But the gang 's all waitin' to see the dope on the Inland installation 'fore they make up their minds on what 's what," sez Chubbie.

"Sorta reminds y' of the difference in opinion concerning Gayley's process."

"Well I don't know, Boss. I understand one of Gayley's installations used 'round 200,000 feet of pipe through which the cold blast was drawn for compression 'n 11 years after it was installed it was ready for replacement. So the boys tried to get the big boss' okay for a rebuild but he couldn't get the "go-ahead" signal from the front office cuz the maintenance cost was so big an item. 'N so the installation was given the thumbs down. But his system used to put cold blast into the furnace anywhere from 8 or 9 grains down to 1½ grains per cubic foot 'n the little "pot" made from 16 to 18 per cent more iron", Stubbie sez.

"Not a bad increase, huh Stubbie? There's a furnace out at Gary that once ran on 3½ grains moisture for a year 'n they found the stack threw the best quality iron when the moisture content was between 3 and 4 grains. Course they got their best tonnage in the spring and fall months."

"Yeh, that's what we found at my old company's plant. I 'member, Boss, we ran an 'xperiment by turnin' steam into the cold blast main between the blowin' ingines 'n the stoves. 'N we kicked the moisture content up a couple of grains."

"I'll betcha the stack started to travel, didn't she, Chubbie?"

"Sure did, Boss. But the sulphur jumped from 0.035 to 0.055 on the next cast 'n we cut the steam off. When the iron followed the bar we drove into the iron notch the next cast, the chemist shouts, 'Boys, the sulphur 's back were she was 'fore y' started playin' 'round with the steam.' We found steam would kick the tonnage into higher brackets but we wouldn't get quality,", Stubbie remarked.

"What did the fellers have to say 'bout the use of sinter?", I inquired.

"Y' 'member Joe Slater up at Republic, don't y' Boss? Joe's had a lotta 'xperience usin' sinter. He's charged anywhere from 20 to 75 per cent in the burden and found that after y' get up to 40 per cent, y' get an increase in tonnage, but above 50 per cent the stock begins to open up 'n y' get a drop in the coke yield."

"How much additional tonnage do y' get usin' 20 per cent or more sinter?"

"Oh 'bout 6 or 7 per cent, I think Joe sez, with sinter runnin' 'bout 61 per cent iron. One of the fellers told 'bout a practice in the Chicago district. The total burden was made up of 61 per cent sinter during March 1933 'n for that month the stack had a coke practice of 1473 tons per ton of iron which never has been equalled at his plant. Another feller from the East gets on 'is feet 'n sez, 'we gotta stack with a hearth diameter of 17½ feet and with a burden of 100 per cent sinter, we're knockin' out iron on 1342 tons of coke per ton of metal. The furnace is rated at 775 tons per 24 hours and we're blowin' 35,000 cubic feet of wind per minute. Our top temperatures are runnin' 500 to 600 degrees Fahr.' 'N Boss, you should of seen the fellers move to the edge of their chairs when he sez '1342 tons of coke'. No wonder the fellers have got their eyes on their sinterin' plants today, huh?", sez Chubbie.

* * *

After the afternoon session there was a demonstration of top fillin' at one end of the meetin' room and the test showed that it 's easy to keep little hoppers and big hoppers filled when y' got the proper materials in the stockhouse 'n keep hoistin' 'er up accordin' to modern practice.

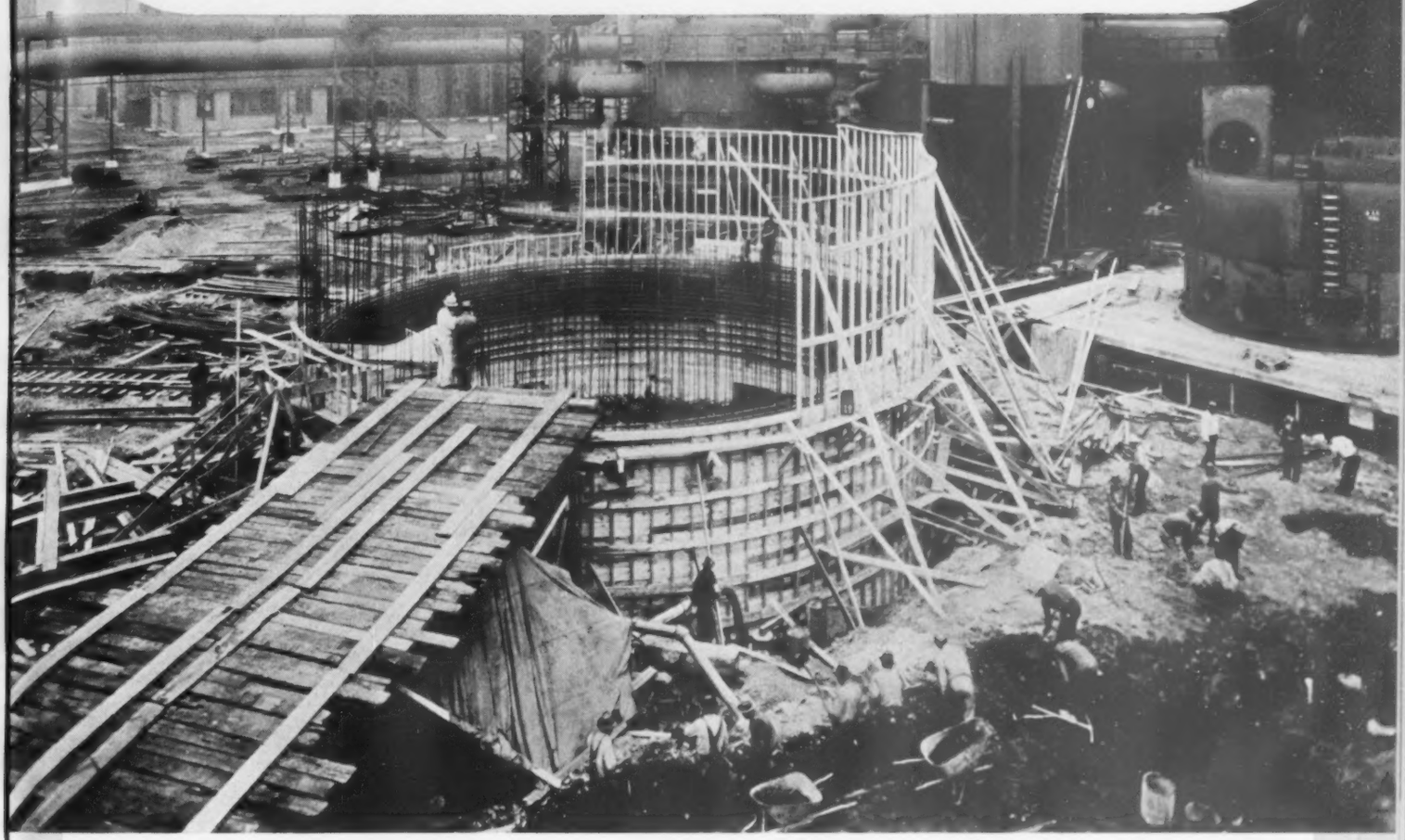
So long, fellers. I'll be seein' ya.

"Shorty" Long

*Mr. Miller's story on "Air Conditioning" appears on page 88 of this issue.

McKee can help you step up production by

MODERNIZING EXISTING UNITS



Furnace Foundations and beginning of stove construction

MAXIMUM PRODUCTION is obtained only from a plant operating at maximum efficiency.

Today, when iron and steel production is so vitally important, reconstruction of existing units has become a first essential in increasing tonnage.

In rebuilding your existing units Arthur G. McKee & Company can reduce the shut-down period of the unit four ways:

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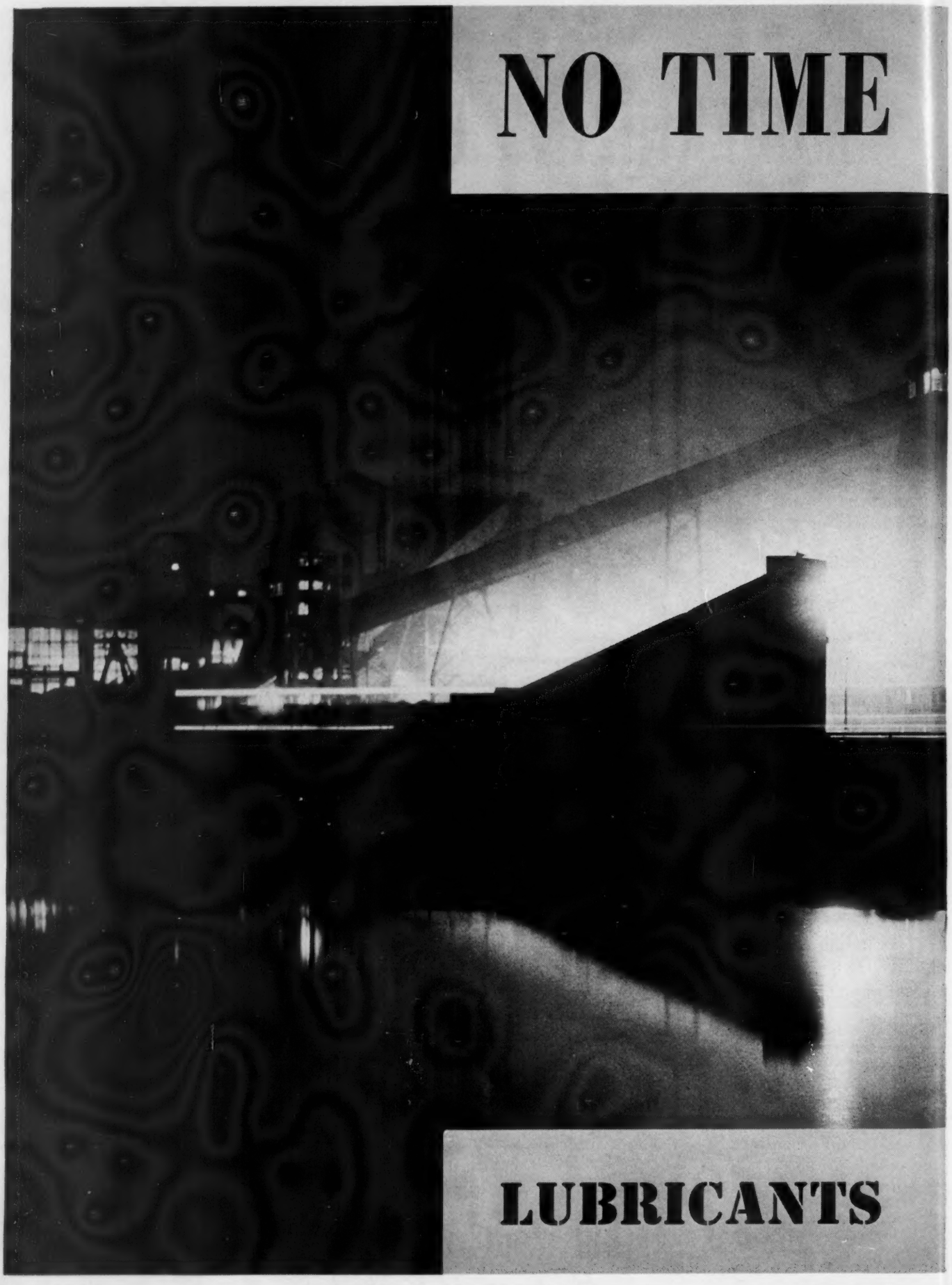
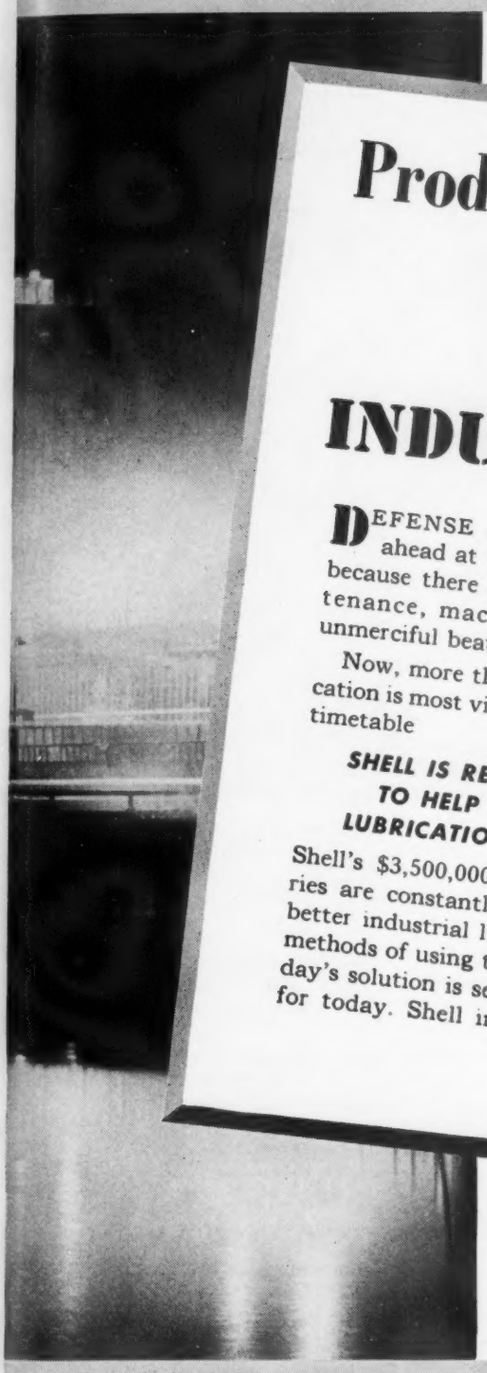

NO TIME
LUBRICANTS

FOR "TIME OUT"—



Production keeps humming with SHELL INDUSTRIAL LUBRICANTS

DEFENSE production is driving ahead at breakneck speed . . . and because there is little time for maintenance, machines are taking an unmerciful beating.

Now, more than ever, proper lubrication is most vital to your production timetable

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Shell's $3,500,000 research laboratories are constantly at work creating better industrial lubricants . . . better methods of using them . . . for yesterday's solution is seldom good enough for today. Shell industrial oils and greases are being used by every type industry . . . to eliminate bottlenecks . . . increase production . . . lower costs And because there is no time to experiment, you'll appreciate Shell's industrial lubricants being plant-tested . . . proved . . . under actual operating conditions.

Is your plant getting the benefit of all that is new in industrial lubrication, as it develops? Have a Shell man check over your lubrication setup and be sure You'll find his recommendations entirely practical—and made without obligation. And with the use of Shell lubricants you are assured of the continued watchfulness of Shell men—a service that needs no prompting.

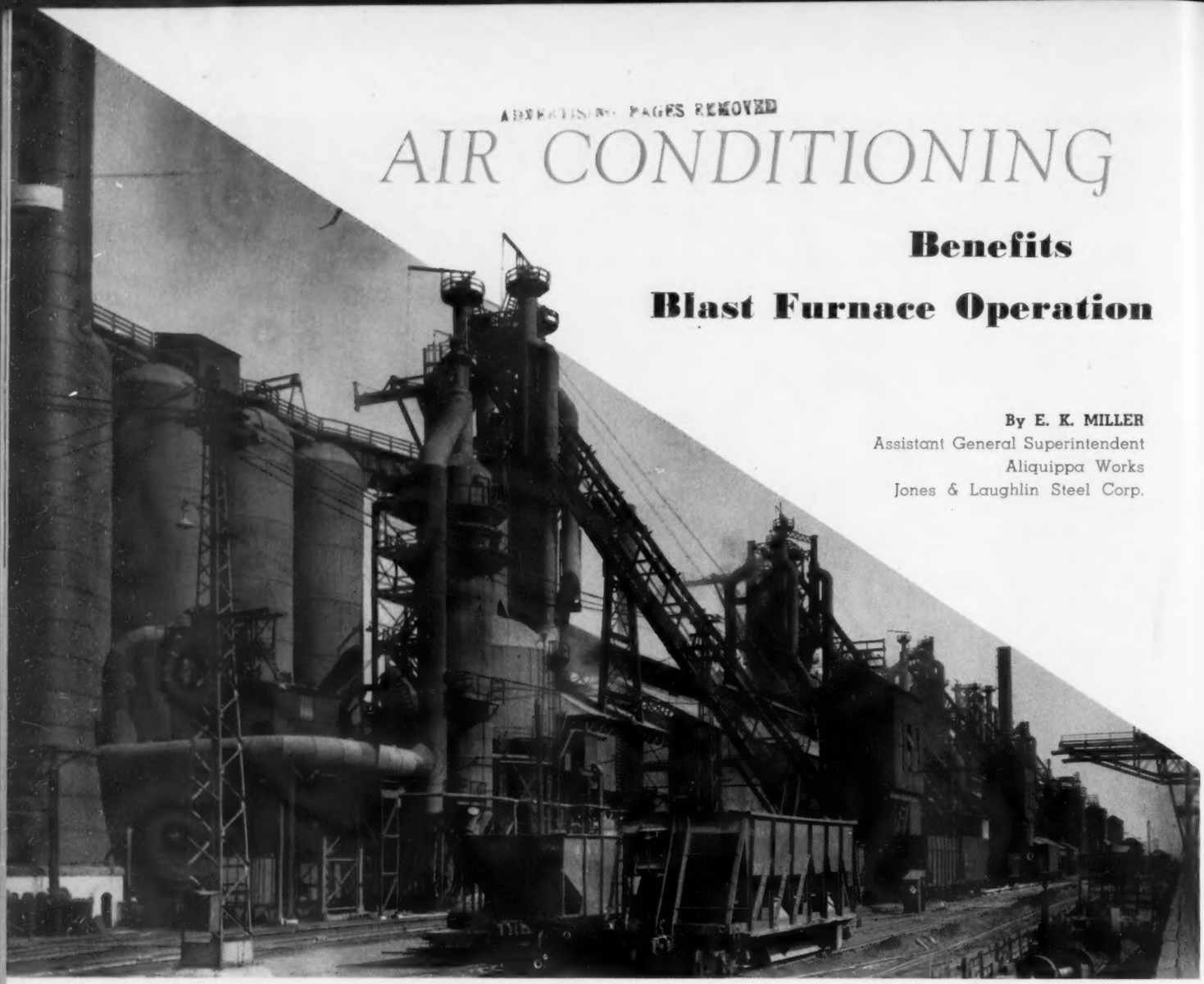
SHELL

FOR EVERY INDUSTRIAL USE

ADDITIONAL PAGES REMOVED

AIR CONDITIONING Benefits Blast Furnace Operation

By E. K. MILLER
Assistant General Superintendent
Aliquippa Works
Jones & Laughlin Steel Corp.



Group of blast furnaces at the Aliquippa works of Jones & Laughlin Steel Corp., Aliquippa, Pa., showing the air-conditioned No. 1 stack in foreground

Six months' operating data on a 1300-ton stack in the Pittsburgh district equipped with a 3-grain pre-compression chilled water air conditioning system disclose a more uniform working furnace, a reduction in the amount of coke per ton of iron and an increase in the production of iron

■ MANY executives in the steel industry have considered the conditioning of blast furnace air more or less of an experimental operation, and have questioned whether or not air conditioning of the blast furnace could be justified in the northern states.

James Gayley, in 1904, built the first refrigerating plant to freeze the moisture out of the air for the blast in one of the Isabella blast furnaces of the Carnegie-Illinois Steel Corp., Etna, Pa. Similar installations followed the Gayley plan at Pottstown and Birdsboro, Pa.; Chicago; and Cardiff, Wales. The principle of dry blast, as it was known in those days, was definitely proven but was abandoned in 1916 at the Isabella blast furnace plant due to the high investment and maintenance costs involved.

While the practice of dry blast was discontinued because of the lack of suitable equipment to effectively do the work, the need for a practical means of eliminating a variation in humidity of blast furnace air remained.

After the abandonment of the Gayley plant in 1916, there is no record of anything further being done to control the humidity of the blast

Data Covering Six Months' Operation of No. 1 Aliquippa Stack on Controlled Blast

Period: With Air Conditioning	Period: Without Air Conditioning	% Increase in Iron Production	% Reduction in Coke Consumption	Humidity, gr./cu. ft. Air: Natural Air Min.	Natural Air Max.	Natural Air Avg.	Conditioned air
Apr. 1941 to Sept. 1941, Inc.	Monthly average for year 1940 ..	8.22	3.03	1.355	9.962	5.087	3.298
June, 1941	June, 1940 ...	14.55	4.31	2.746	9.066	5.666	3.351
July	July	16.67	5.46	3.064	9.962	6.702	3.642
August	August	14.84	3.04	3.064	8.782	5.757	3.499
September	September ...	18.46	*0.25	2.849	9.655	5.398	3.251
June to Sept. incl.	June to Sept. incl. ..	16.07	*4.26				

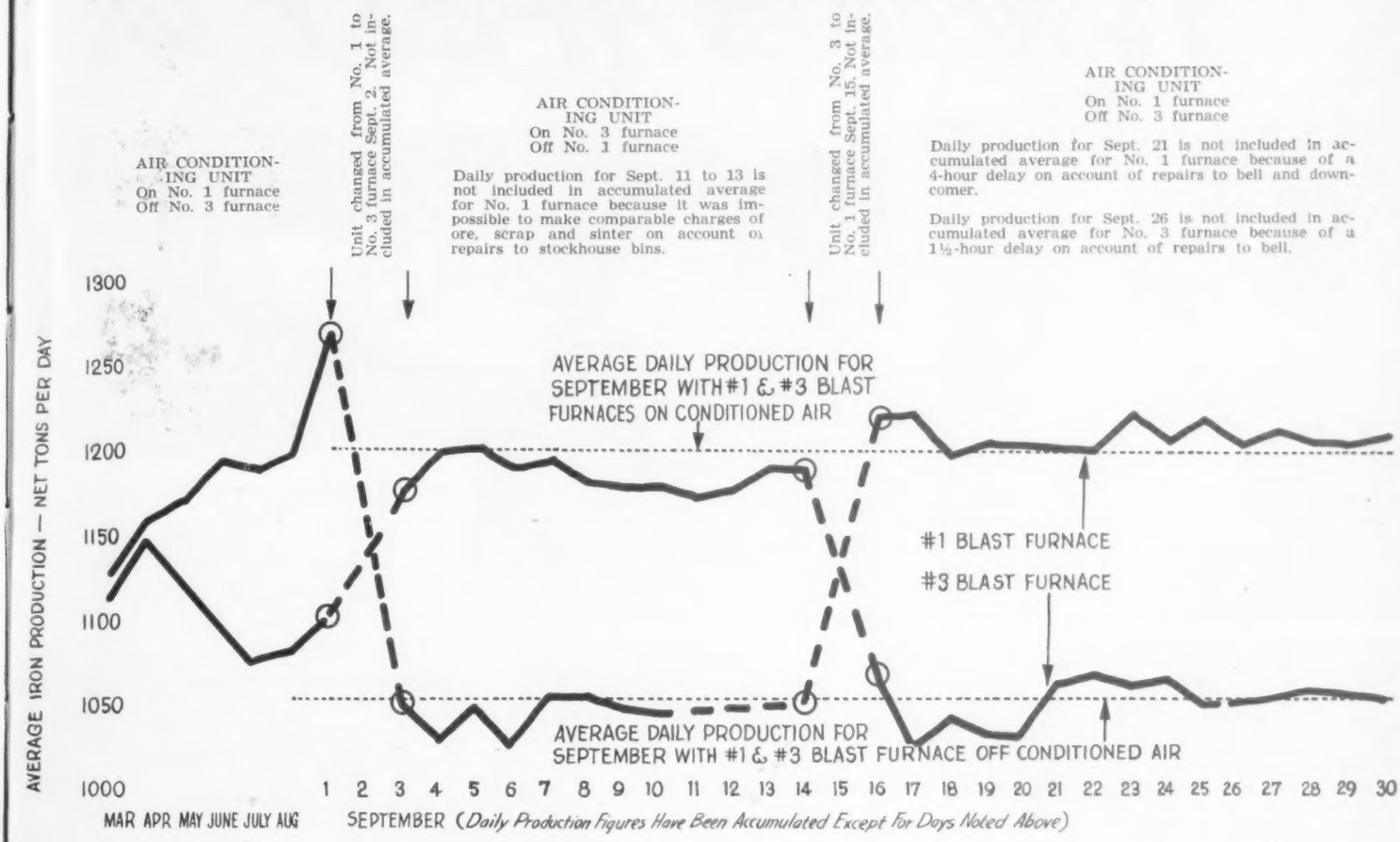
*September, 1941, coke was not representative during the test period on air conditioning; consequently, the reduction of 4.26% indicated above was based on June to August, 1941, versus comparable months in 1940.

Paper presented at the joint meeting of the Eastern States and Chicago District Blast Furnace and Coke Oven Association, University Club, Cleveland, Oct. 24.

AVERAGE IRON PRODUCTION — NET TONS PER DAY

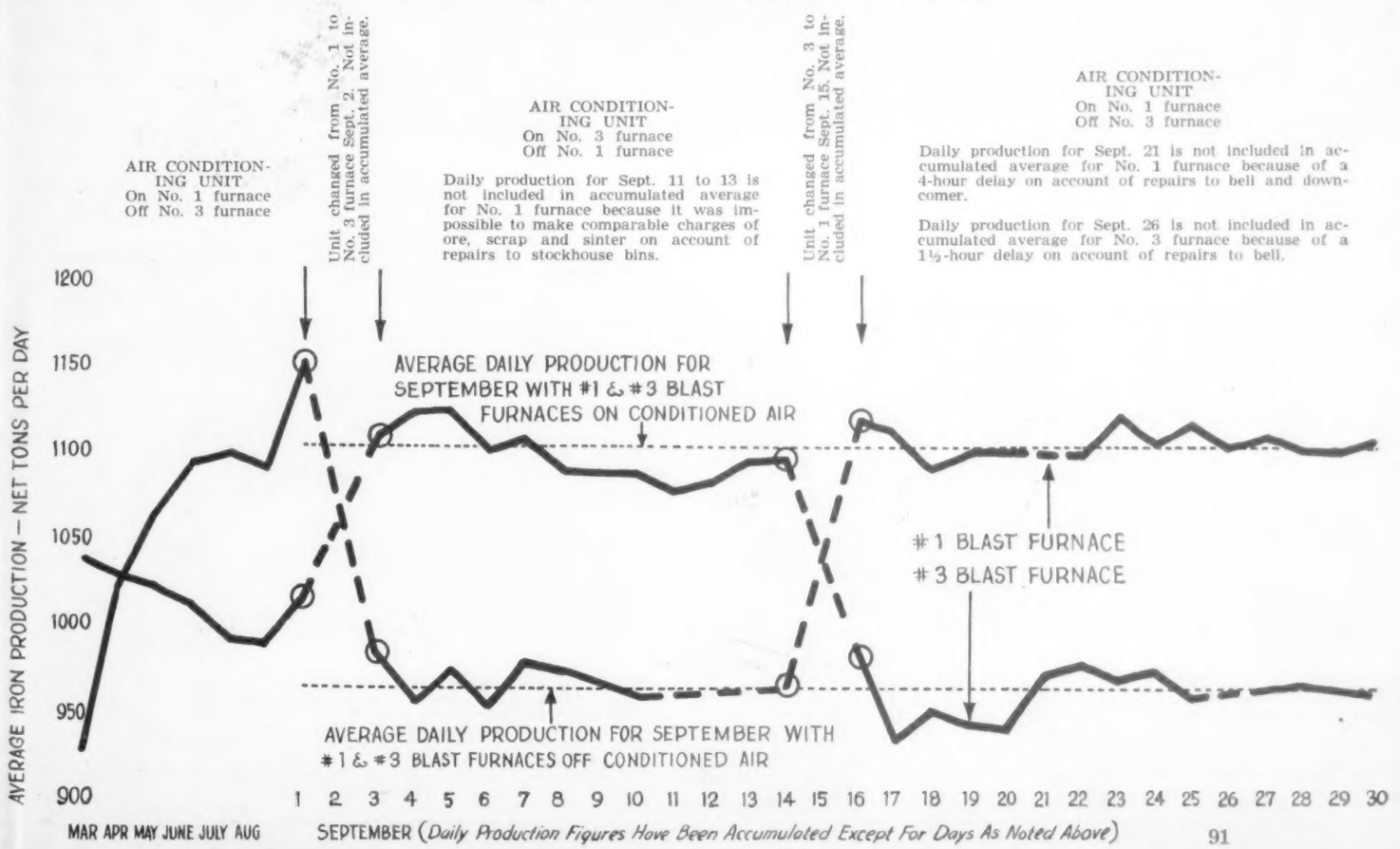
Effect of Air Conditioning on Blast Furnace Output

When NOT deducting total scrap charged from iron production


AIR CONDITIONING UNIT
On No. 1 furnace
Off No. 3 furnace
Unit changed from No. 1 to No. 3 furnace Sept. 2. Not included in accumulated average.
AIR CONDITIONING UNIT
On No. 3 furnace
Off No. 1 furnace
Daily production for Sept. 11 to 13 is not included in accumulated average for No. 1 furnace because it was impossible to make comparable charges of ore, scrap and sinter on account of repairs to stockhouse bins.
Unit changed from No. 3 to No. 1 furnace Sept. 15. Not included in accumulated average.
AIR CONDITIONING UNIT
On No. 1 furnace
Off No. 3 furnace
Daily production for Sept. 21 is not included in accumulated average for No. 1 furnace because of a 4-hour delay on account of repairs to bell and downcomer.
Daily production for Sept. 26 is not included in accumulated average for No. 3 furnace because of a 1½-hour delay on account of repairs to bell.
AVERAGE IRON PRODUCTION — NET TONS PER DAY
1300
1250
1200
1150
1100
1050
1000
AVERAGE DAILY PRODUCTION FOR SEPTEMBER WITH #1 & #3 BLAST FURNACES ON CONDITIONED AIR
#1 BLAST FURNACE
#3 BLAST FURNACE
AVERAGE DAILY PRODUCTION FOR SEPTEMBER WITH #1 & #3 BLAST FURNACE OFF CONDITIONED AIR
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
MAR APR MAY JUNE JULY AUG
SEPTEMBER (Daily Production Figures Have Been Accumulated Except For Days Noted Above)

Effect of Air Conditioning on Blast Furnace Output

When deducting total scrap charged from iron production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1200
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950
900
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#1 BLAST FURNACE
#3 BLAST FURNACE
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1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
MAR APR MAY JUNE JULY AUG
SEPTEMBER (Daily Production Figures Have Been Accumulated Except For Days As Noted Above)

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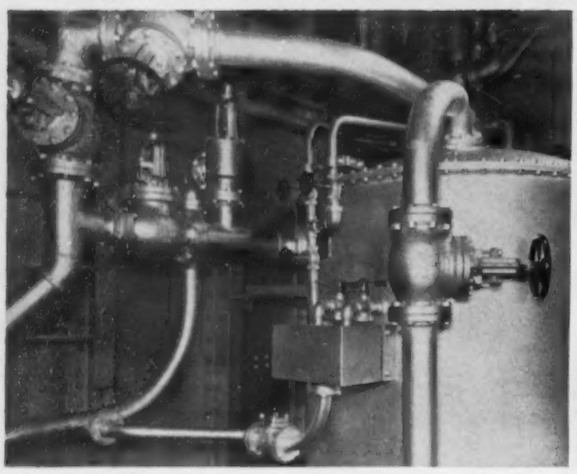

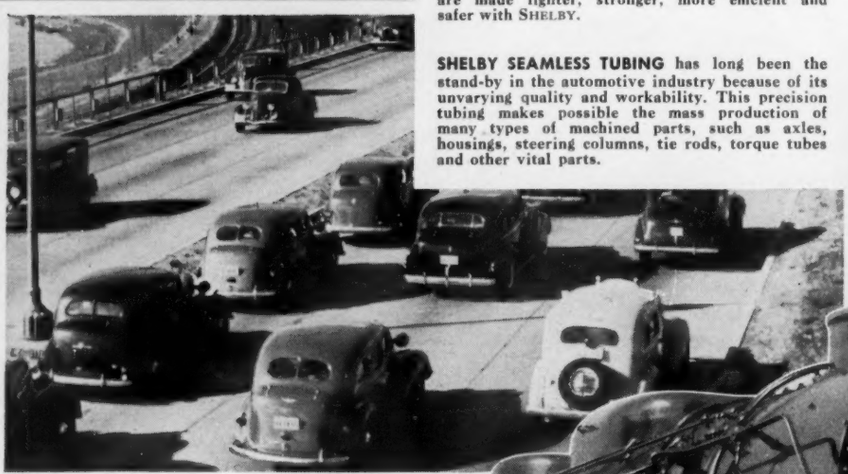

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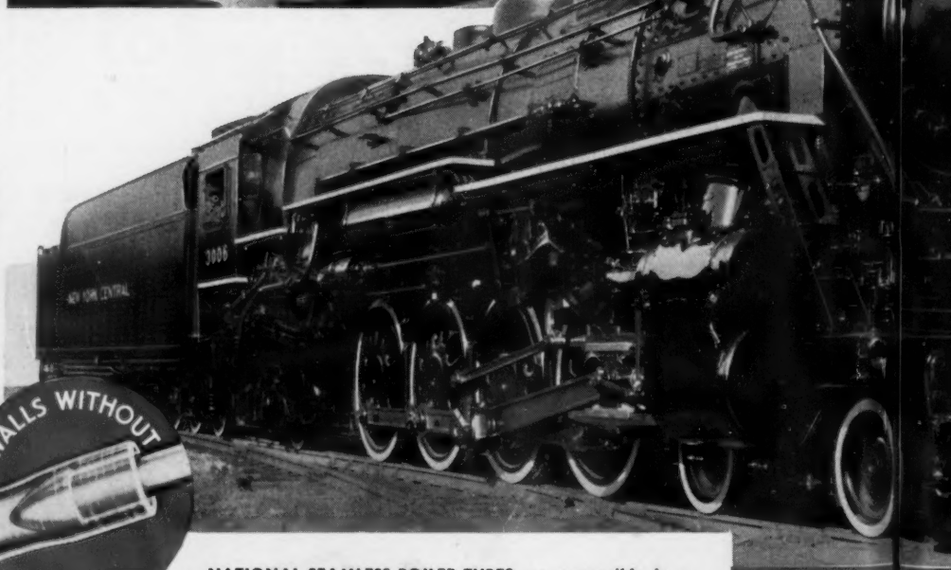
MARINE ENGINEERS AND ARCHITECTS unhesitatingly specify NATIONAL Seamless — for the boilers, the high-pressure steam lines—for booms, masts, and yardarms. No other pipe or tubing offers the same degree of safety, or has shown such consistently high records for length of service, and ease and economy of maintenance. NATIONAL is the favorite for hard service on the seas.



WALLS WITHOUT WELDS

SPECTACULAR ADVANCES have been made in deep well drilling in recent years. Oil and gas wells extending down into the earth two miles and more are not unusual—and can largely be attributed to the superior strength and efficiency of NATIONAL Seamless. NATIONAL Seamless ably withstands the racking, jolting strains of such service, and has contributed materially to profitable oil production in every field in the country.

NATIONAL SEAMLESS BOILER TUBES are responsible in a large degree for the increased speeds and operating economy of the new type passenger and freight locomotives. They can save in labor costs and installation time because they're more ductile, easier to work with. And throughout the modern train, the added stresses and vibration of the new speeds require stronger, finer pipe in all steam, water, and air lines. NATIONAL Seamless Pipe is again the first choice.

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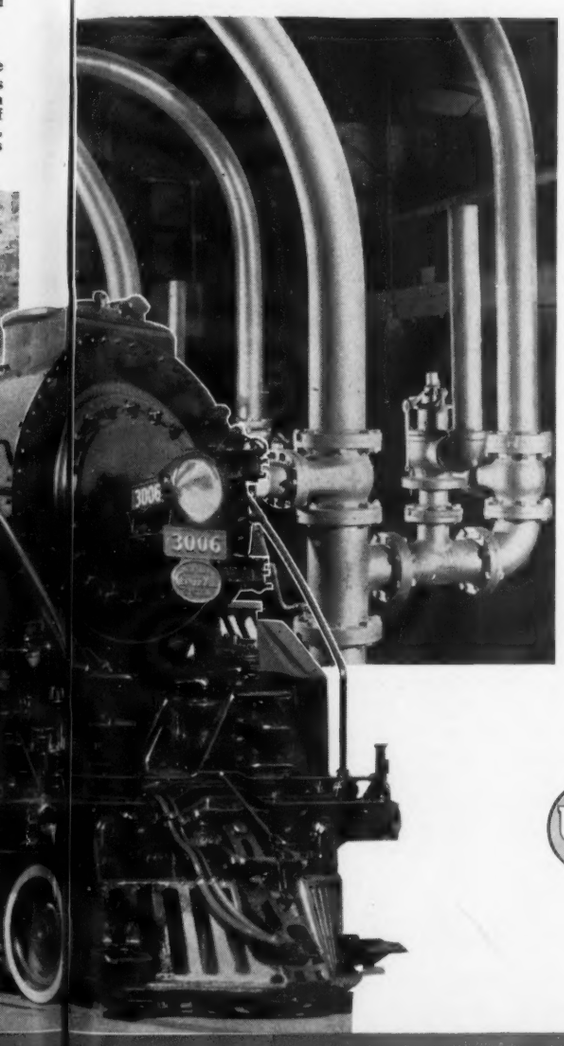
American industries confidently rely on the proved superiority of NATIONAL SEAMLESS Pipe and Tubes

PIPING IN POWER PLANTS must be able to withstand the new high temperatures and pressures. Experienced engineers have unhesitatingly placed Seamless at the top of the list. For years, this strong, uniform pipe has remained in a class by itself. No other pipe has been able to offer a higher degree of safety and workability, or greater length of service than NATIONAL Seamless.



THE dual requirements of maintaining the utmost in safety while absorbing increasingly heavier loads in service can be satisfied only with products that offer *maximum* dependability with *minimum* attention in operation—especially is this true of pipe and tubing. With these factors influencing selection, more and more industries today assign their toughest pipe and tubing jobs to NATIONAL Seamless. This farsighted policy is paying rich dividends in smooth, uninterrupted performance.

NATIONAL Seamless means "Walls Without Welds." It stands for uniformly high wall strength, dimensional accuracy, and consistent workability — metallurgy's closest approach to the perfect tube. Power plant men say that it cannot be excelled in high pressure service. Marine engineers say it more than pays its way in increased efficiency and dependable operation. It adds to the speed and economy of modern locomotives, reports the railway industry. Oil well drillers bore deeper into the earth because of its high tensile strength. Aircraft and automobile manufacturers rely on it to reduce weight without sacrifice to strength—to lower machining costs and to provide the necessary continuous uniformity which makes possible mass production of "parts." In many other ways—on land, on sea, and in the air—wherever safety is vitally important, America's industry confidently relies on NATIONAL Seamless.

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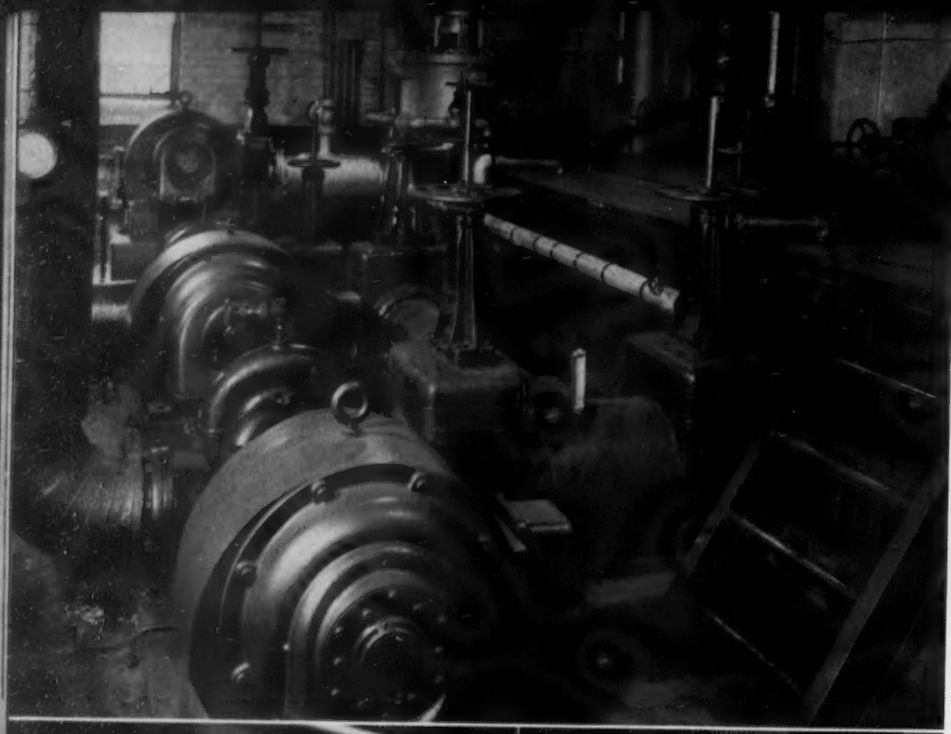
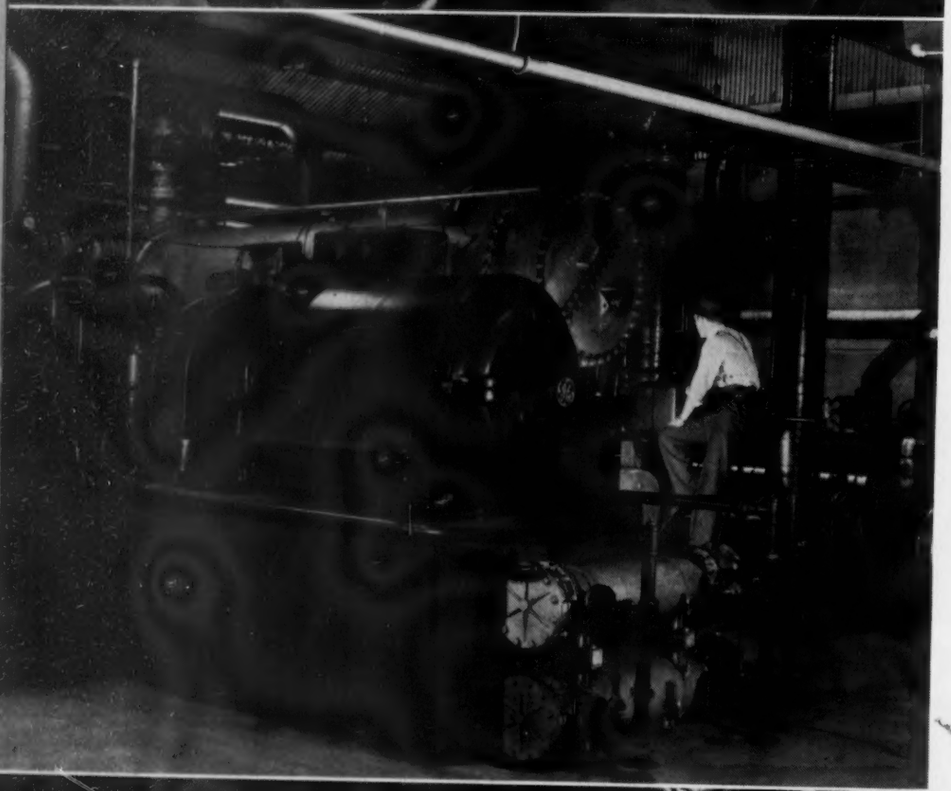




until 1939. At that time, the Woodward Iron Co., Woodward, Ala., taking advantage of the improved air conditioning equipment then available, installed a pre-compression chilled water system on one of their blast furnaces to eliminate the high and widely fluctuating humidity in the atmosphere which interfered with the uniform and smooth working of its furnaces. The equipment was set to maintain a constant moisture content of 3 grains per cubic foot in the blast.

As a result of the marked improvement on one furnace having the blast held uniformly at 3 grains, the Woodward company installed similar air conditioning units on its other two blast furnaces. The experience at this plant demonstrated the adaptability of modern air conditioning equipment for controlling humidity in the blast.

First Northern Installation

Satisfactory performance of the air conditioning unit at the Woodward Iron Co. was a factor that influenced the Jones & Laughlin Steel Corp. to consider an air-conditioning installation. On April 2, 1941, a pre-compression chilled water system was put into operation on one of its five blast furnaces at the Aliquippa works, Aliquippa, Pa., to obtain first-hand information as to the benefits that could be expected by reducing and controlling the moisture content in the blast air. This was the first modern air conditioning unit to be installed on a northern stack. This furnace, designated as No. 1, has a hearth diameter of 28 feet 6 inches, height of 90 feet, a bosh diameter of 30 feet, and is equipped with 18 tuyeres through which 80,000 cubic feet of air passes per minute.

In the first six months that the air conditioning equipment has been in operation on this stack it has definitely demonstrated that there is much to be gained by eliminating the high and widely fluctuating humidity in the blast air.

The operation of this furnace is noticeably smoother and more uniform than our other four blast furnaces which are not equipped with air conditioning and, of course, this is confirmed by an attractive improvement in iron production and coke consumption, as shown in the accompanying table.

From this table which gives the

(*Please turn to Page* 112)

Top view, interior of air conditioning room showing motor-operated pumps

Center view, refrigeration machinery which serves the pre-compression chilled water system

Bottom view, dehumidifying chamber where air is cleaned of dust, atmospheric fumes and excess moisture

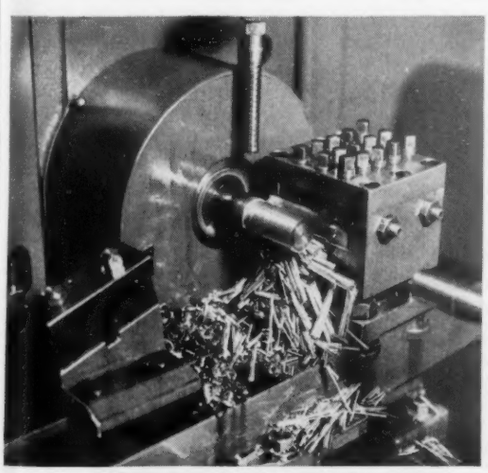
rush

You get it with the OSTER NO. 601 TURRET LATHE

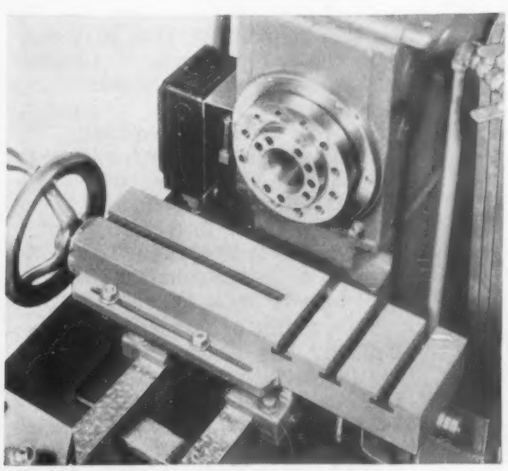
A battery of Oster No. 601 Turret Lathes offer exceptional flexibility in meeting simultaneous multiple operations on high production schedules with ability to divert one or more machines to emergency short-run operations at any time.

Where requirements call for 3 or fewer operations, the No. 601 can be furnished with a plain saddle instead of the six position turret.

The No. 601 equipped with the six position turret each face of which is tapped with six holes for mounting various sizes of tool holders.



Equipped with WORM DRIVE, the smooth flow of power permits unusually heavy forming cuts with absence of chatter.



Spindle nose of the machine is No. 6-A1 American Standard Flange Type ground to master gauges.

Chances are good that you need one or more Oster No. 601 Turret Lathes! Enlarged plant facilities completed recently by Oster make it possible to speed up deliveries on rush orders placed NOW!

You don't need highly skilled operators to man Oster No. 601 machines. They are simplified throughout. Equipped with hand lever-operated, six-position turret, the No. 601 is capable of performing a wide diversity of bar and chucking jobs.

The Oster No. 601 is a NATURAL for rapid training of new men and apprentices!

Versatile in meeting *your* needs *at least cost,* the No. 601 can be furnished with either WORM DRIVE in a range of spindle speeds from 71 to 1034 R.P.M., or with DIRECT DRIVE in a range of spindle speeds from 450 to 3000 R.P.M.

Other options include the machine equipped with six position turret or with plain saddle where three or fewer operations are required.

Illustrations and descriptions on this page are part of the complete details about the new Oster No. 601 covered in CATALOG 27-A. *Your* copy is waiting for you. Request us to *rush* it at once. Write:

THE OSTER MFG. CO.
2037 EAST 61st ST. • CLEVELAND, OHIO, U.S.A.

GET GOING AND KEEP GOING FASTER WITH AN OSTER

ADVERTISING PAGES REMOVED

Resonant Vibration

(*Continued from Page 65*)

is produced by a direct current through a field coil wound on the structure. A freely moving coil in the air gap of the magnetic structure is energized by alternating current of a frequency at which it is desired to vibrate the specimen. The moving coil is attached to the specimen by means of a suitable clamp. Since the coil vibrates with the specimen, the mass or weight of the specimen must be large compared to that of the coil or the natural frequency will be changed.

Electronic devices for supplying alternating-current power to such a vibration motor are usually assembled in one unit. They may comprise one or more rectifiers and vacuum tube switches for converting direct-current power to alternating current of variable frequency. The size and number of tubes, of course, depends on the power output required. Where the frequency is not controlled by a feed-back arrangement, a source of variable frequency such as a beat frequency oscillator may also be built into the unit.

Such a unit of large capacity was built by the General Electric Co. for investigating high-frequency vibration of relatively stiff objects. This unit, Figs. 7 and 8, consists of an amplifier with a 1000-watt output assembled with a beat-frequency oscillator. The frequency range of the amplifier at that output is between 60 and 20,000 cycles per second. It can also be used at reduced outputs up to 40,000 cycles per second. The left side of the unit contains a 100-watt amplifier which can be used separately. When larger power output is required, the first amplifier provides the power to drive the tubes of the 1000-watt amplifier located in the righthand side.

The desired frequency is adjusted on the large dial in the center of the unit as shown in Fig. 8. The power is regulated by the small dial visible at the upper righthand corner of the center panel. The operation of this unit is very much simplified by the installation of push buttons for the control of the different circuits.

The 1000-watt amplifier and the vibration motor have been used largely for studying the vibration of short, stiff turbine buckets, both individually and assembled in wheels. Such buckets operate in turbines under tremendous steam forces which always pulsate more or less with respect to the buckets. The vibration characteristics of the buckets must be such that they are not broken by vibrating in resonance with these forces.

Fig. 8 shows this equipment set up to vibrate a bucket wheel. It is found that the buckets vibrate in characteristic patterns, formed by alternate active and quiet spots around the circumference of the wheel. The number of quiet spots, or nodes, depends on the frequency, as shown in Fig. 11 for a typical bucket wheel.

Turbine nozzles, through which the steam expands and is directed at the buckets, are formed by a series of airfoil-shaped partitions. These also experience pulsating forces as a result of the interruption of the steam flow by the passing buckets. The natural frequency of the nozzle partitions must not coincide with the frequency at which the buckets pass, else they may vibrate with sufficient amplitude to break down through fatigue in a short time. The natural frequency of such partitions has been determined by vibrating them with a magnetic arrangement such as that shown in Fig. 4, using the 1000-watt amplifier for alternating-current power. The frequency of a typical section, as a function of the nozzle length or radial height, is shown in Fig. 10.

Models afford a convenient means of studying certain design features of relatively large structures. The natural frequency of geometrically similar structures of the same material varies inversely as the size. If the natural frequency of the prototype is of the order of 100 to 200 cycles per second, a one-tenth scale model will have a corresponding frequency of 1000 to 2000 cycles per second, which is well above the

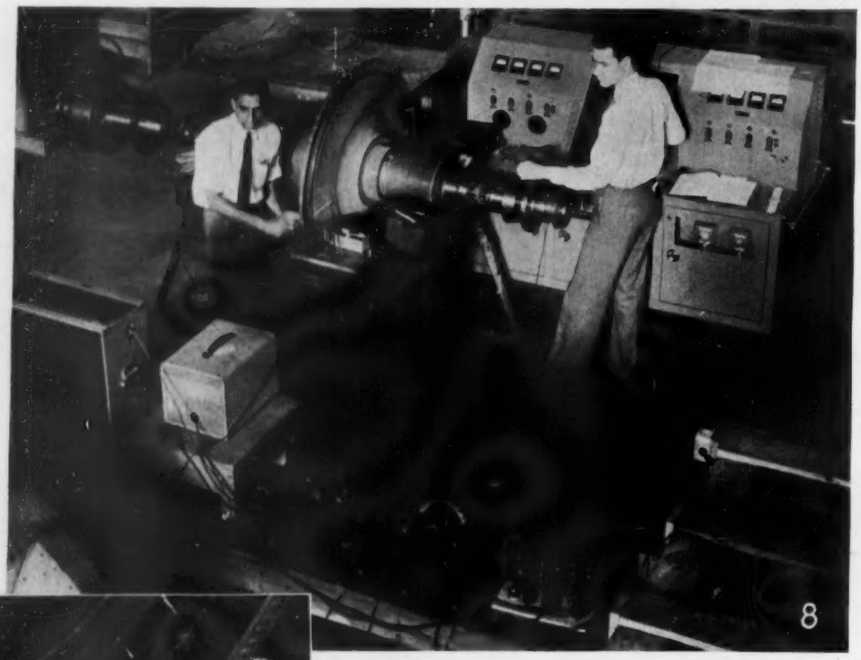


Fig. 8—This is the complete setup for a turbine bucket test. Operator at right adjusts power while assistant holds hand vibration detector against turbine bucket. Both watch row of instruments facing them on bench in foreground

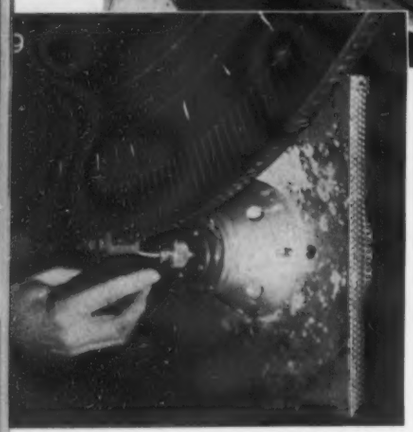


Fig. 9—Closeup showing how vibration motor is connected to turbine wheel for vibration test

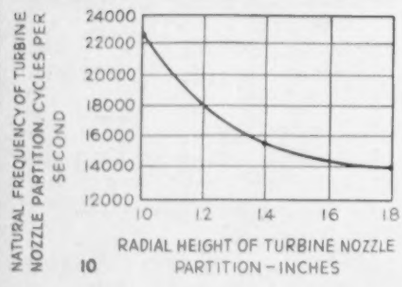


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Fig. 10—Chart showing relation between radial height of the turbine nozzle partition and natural frequency of the partition

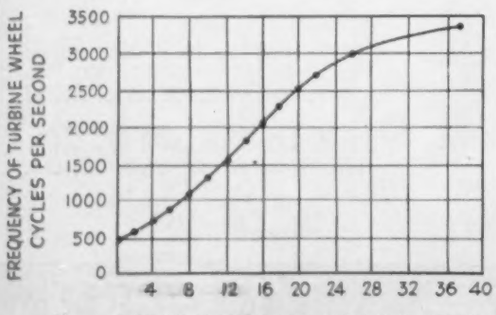

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Fig. 11—This chart shows how number of nodes of turbine wheel varies with frequency

COUNSEL *for* DEFENSE

★

Meeting orders for **NEW** equipment

Easton has put more men to work, has greatly increased manufacturing facilities, and has taken other decisive steps to meet today's unprecedented demands. Industrial cars of all types, trailers, electric trucks and other material handling units are rolling out at a pace we once thought impossible.

★

Speed-ups with your **OLD** equipment

Because we are working against an abnormal backlog, Easton Sales Engineers are free to give their time and counsel toward helping you to get more efficient service with your old equipment. These men can give you new and useful ideas for immediate speed-ups and savings in handling and storage methods. It will pay you to take advantage of their free counsel.

★

Buying and selling **USED** equipment

Easton has created a "salvage headquarters" for used industrial wheeled haulage equipment. For the duration of the emergency Easton Sales Engineers will be available for counsel and assistance in the purchase or sale of used cars, electric trucks, trailers or other industrial handling equipment. If you have one or more units to sell, send a description with specifications. Engineering Counsel, Easton Car & Construction Company.

W. E. FARRELL, founder, president and first Easton Sales Engineer. Years of experience with the toughest material handling problems, a thorough knowledge of all types of industrial haulage equipment, a practical creative engineering ability . . . those are the assets which the Easton Sales Engineer brings to you in Free Counsel.

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INDUSTRIAL CARS
for hand or locomotive haul, or electric

INDUSTRIAL TRAILERS AND SEMI-TRAILERS
for hand, tractor or motor-truck haul

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DUMP BODIES
for cars, trucks and trailers

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Over twenty-five years service to industry in the design and construction of cars, trucks and trailers for every industrial purpose. Capacities ranging from 2 to 250 tons.

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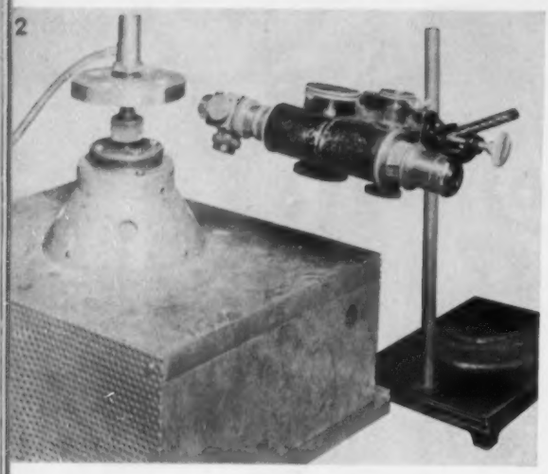


Fig. 12—Here vibration motor is used to drive a small high-frequency shake table for calibrating various vibration measuring devices. Note the microscope set up at right and focused on a point on the shake table to measure amplitude of the vibration

range of ordinary magnetic excitation methods.

Models of large turbo-generator frames have been vibrated with the vibration motor and 1000-watt amplifier to study the effect of various factors on the natural frequency. Such frames must have a natural frequency well above twice the operating speed to avoid excessive vibration under the force pulsation produced by the two-pole rotor.

The vibration motor is also used to drive a small high-frequency shake table for calibrating various vibration measuring devices. Fig. 12 shows it set up for this purpose. The device to be calibrated is mounted on the table, and its response is observed at various frequencies and amplitudes. The latter are measured by a microscope.

In the past, vibration phenomena were considered to comprise a rather limited field, but engineers realize today that a knowledge of these phenomena is of great importance in many branches of their work. Since equipment of the type described is eminently suited to stimulating vibrations, it should become an increasingly popular tool.

INDUSTRIAL DESIGN TRENDS

. . . . as affected by priorities now and by the increased supplies of raw materials that will be available after the emergency

By **RAYMOND LOEWY**
Industrial Designer
580 Fifth Avenue
New York

■ THE DAY when materials were available in practically unlimited quantities is over for the time being, and manufacturers in all fields are adjusting themselves to the new conditions.

Just how this emergency is affecting industrial design is a moot question. The matter of conserving materials which are necessary to the defense program reposes a responsibility on the conscientious designer. In the normal process of design, research has ever been a great part of the evolution to the finished product. New methods of procedure, new uses and combinations of materials for design in manufacture have accrued in some cases to the benefit of both design and manufacture.

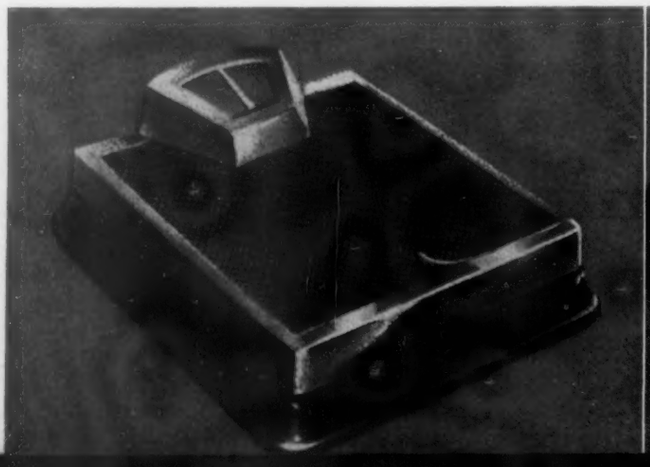
The extensive incorporation of materials such as aluminum, chromium, stainless steel and, within the last seven or eight years, that prodigious family of chemical products, plastics, in product design, is the result of the designer's ingenuity in realizing the flexibility of these resources. Just as the use of these materials affected the appearance of objects and structures in common use so that lack of them will produce a similar revolution in the appearance of things about us. After the steam roller of defense demands has passed over industry, the designer must exercise a greater degree of inventiveness than ever before.

But the very lack of available materials is having an astringent effect on design. By being forced, for instance, to use a cheaper, less malleable substance than aluminum, the manufacturer and designer are taking time to develop and simplify diecasting processes which, in the past, they have discarded as too complicated. Glass, which cannot be surpassed for sheer beauty, will take on forms which previously had not been deemed practical to attempt. Instead of chromium plating, the designer is finding ways to substitute paint or plastic finishes. The metalization of plastic materials, now in the stages of development, looks most interesting. This process may eventually replace diecasting in many fields as well as various machine parts where rigidity and lightness are factors.

For fear of upsetting the order

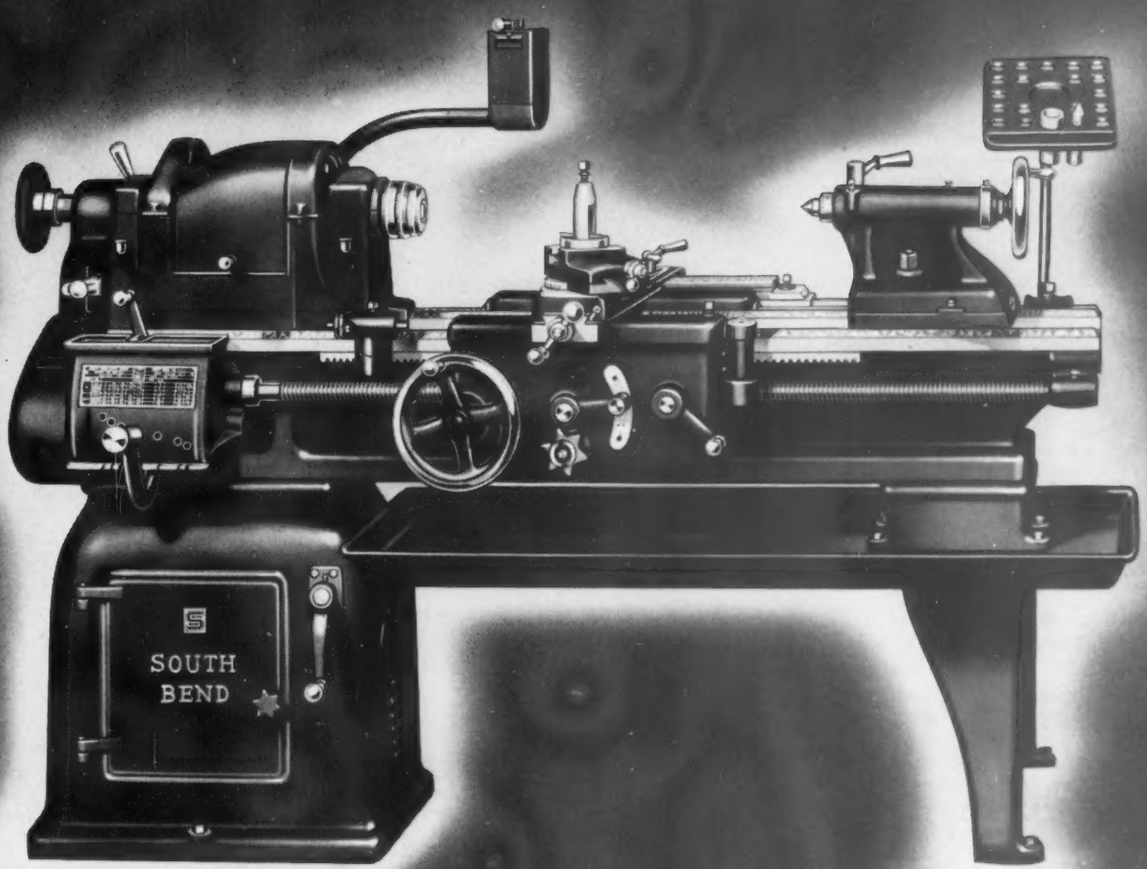
(*Please turn to Page* 115)

Fig. 1. (Left)—Present-day type of bathroom scales. Manufactured parts include a cast iron base, cast platform with rubber treat, chromium plated trim, stamped metal indicator. Fig. 2. (Right)—Future design study of bathroom scales. Casing and platform are of pressed glass. Mechanism and indicator are entirely enclosed enabling the use of foil label, gold plated indicator and a variety of color treatments by spraying inside surfaces of glass with opaque color or metallic finishes, protected from abrasion. In many similar instances such as in a glass flat iron, glass may be used to advantage if the tensile strength of cast iron or the lightness of plastics is not necessary



VERSATILITY

to Speed Production



VERSATILITY which permits quick change-over from one job to another, with little inconvenience or loss of time, is a real speed-up factor in tooling a new job. Such versatility—the reduction of set-up time to a minimum—enables you to get into production quickly. It is one of the advantages in selecting South Bend Lathes for urgent defense contract work calling for early deliveries.

Permanent accuracy is built into South Bend Lathes to assure uniform precision. Their wide range of spindle speeds permits machining work with maximum cutting tool efficiency. And not the least important—their convenient controls make for an ease of operation which reduces fatigue and lessens the possibility of error.

Ideal for the heavy production schedules which National Defense demands, South Bend Lathes come in five sizes—9″, 10″, 13″, 14½″ and 16″ swing—all sizes supplied with toolroom or manufacturing equipment. Write for catalog and name of nearest dealer.

SOUTH BEND LATHE WORKS

896 East Madison Street, South Bend, Indiana, U. S. A.

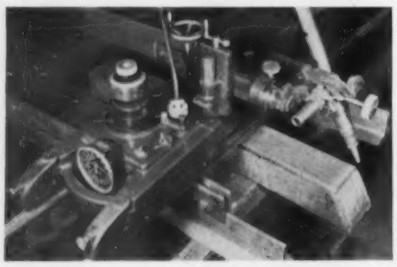
LATHE BUILDERS FOR 35 YEARS

LET'S GO! U.S.A. KEEP 'EM FLYING!

Industrial Equipment

Torch Holder

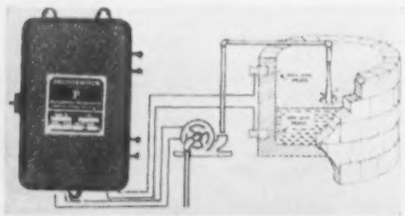
■ Air Reduction Sales Corp., 60 East Forty-second street, New York, announces a new protractor type torch holder which enables an operator to set radiagraph cutting torches for any desired angle of cut with great accuracy. As an example of the type of work for which



the accuracy and time-saving features of the holder are particularly valuable, a bevel cut billet is shown in the illustration. A circular knurled knob permits angular adjustment, as shown on the scale. The holder which has a 90-degree angle range can be attached to any standard Airco radiagraph.

Level Control

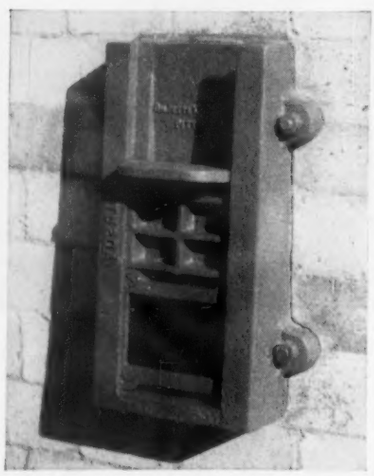
■ Photoswitch Inc., Cambridge, Mass., has introduced a new series P16 electronic level control which provides on and off valve or pump control of any liquid. It can be used for controlling water, milk, nitrates, sulphates, alcohol, distilled water, refrigerants, gasoline, etc. Complete equipment is available for single level indication and control, on and off pump-up and pump-down control at two levels, boiler feedwater control and low level safe-



guards. Probe fittings are designed for high and low pressure and temperature requirements as well as for sanitary installations. The probes or electrodes are attached to the tank at levels representing the low point where pumping starts and the high level where pumping stops. These are wired to the level control. When the liquid level falls below the lower probe, the level control starts the pump and the tank fills. When the level rises to the upper probe, the fluid itself acts as a conductor of the small amount of current required for the operation of level control which stops the pump.

Furnace Inspection Door

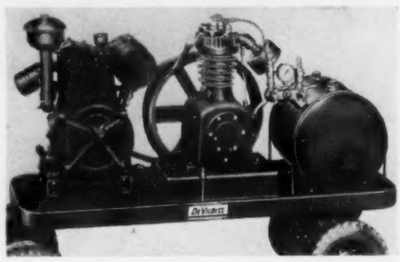
■ Gillette Kiln Sales Co., 728 Investment building, Pittsburgh, has recently developed a furnace inspection door designed to withstand high temperatures. It is applicable to various types of industrial furnaces, on heat treating furnaces and on boilers and kilns having continuous temperatures up to 2500 degrees Fahr. Of simple, rugged construction, the door consists of a cast-iron slide which rides vertically in a cast-iron frame assembly. When closed, the slide rests against the bottom of the frame with its upper section, ribbed to dissipate the heat, closing the opening in the brickwork. To open, the slide is raised to bring a framed, rectangular piece of Pyrex heat-resisting glass oppo-



site the port hole. When an instrument or tool is to be inserted into the furnace, the slide has only to be raised completely above the brickwork port. The door is installed easily on new or existing furnaces.

Spray-Painting Air Compressing Outfits

■ DeVilbiss Co., Toledo, O., has placed on the market two improved series of 4 and 6-horsepower portable spray painting air compressing outfits for operation of two and three spray guns. Twenty assemblies are included in the two series —skid-mounted outfits, rubber-tired and steel-wheeled trucks, and 2-wheeled trailers. The 6-horsepower units are offered with or without an electric starter, and air or water-cooled engines are optional with this series. Spray painting



equipment for use with the outfits may be purchased separately from the air compressing outfits.

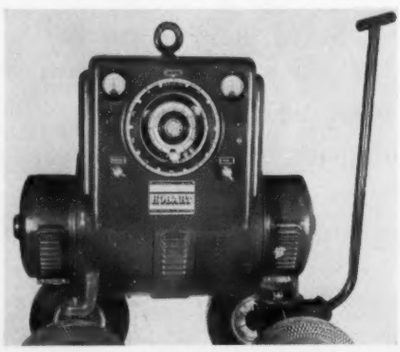
Circuit Breaker

■ Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., reports a new De-ion enclosed type AB-1 circuit breaker for protection of all types of light and power circuits. It is made in four frame sizes, including ratings from 15 to 600 amperes in steps corresponding to commercial wire sizes. All are available with voltage ratings from 250 volts alternating current, 125/250 volts direct current to 600 volts alternating current, 250 volts direct current.

Features common to all frame sizes are: Silver contacts operated by a toggle mechanism to provide a quick "make" or "break" action; bimetal thermal elements to prevent tripping due to harmless overloads; rust and corrosion resisting metal parts; and the De-ion method of arc quenching. The unit is enclosed in a water and dust tight sheet steel case. The operating handle is on the front, thus permitting close banking.

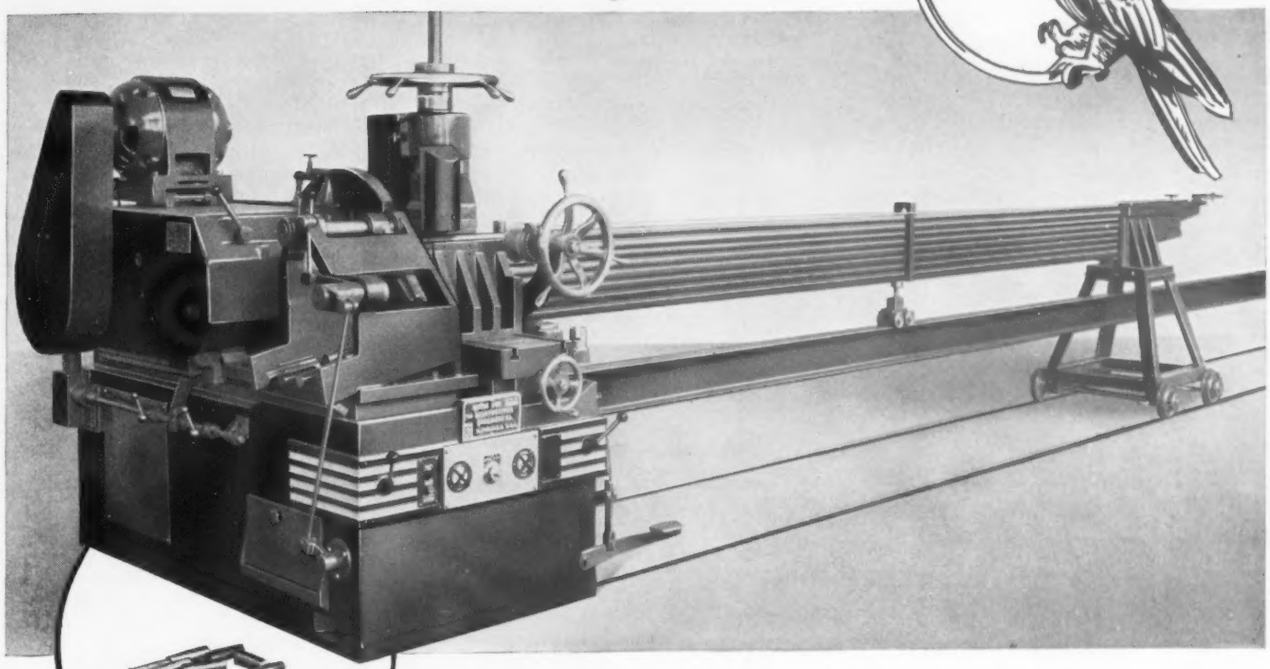
Welder Trailer

■ Hobart Bros. Co., Troy, O., has introduced a new 4-wheeled lightweight pneumatic-tired trailer for

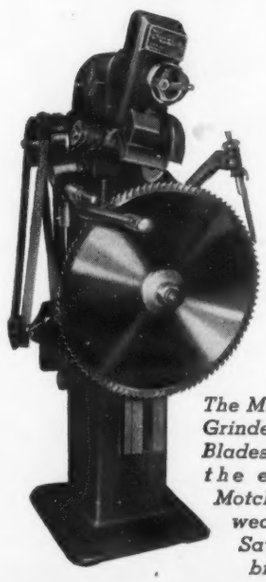


mounting electric drive welders. Easy portability makes it doubly useful enabling it to make hurry-up trips to different parts of the plant and yard for emergency production, maintenance and repair work. The

"Pieces of Eight"



with the MOTCH & MERRYWEATHER COLD SAWING MACHINE



The M. & M. Saw Grinder and Saw Blades round out the efficient Motch & Merryweather Cold Sawing Combination . . .

"PIECES OF EIGHT" indeed. Eight bars of 1⅝" round stock are shown here, about to be cut in one operation. However, the *exclusive* Motch & Merryweather multiple-cutting fixture holds an indefinite number of pieces of round material positively, all ready for rapid-fire action. This new and important refinement greatly increases production, since heretofore not over three round pieces could be held securely. Moreover, the stock cannot turn and break blades. Besides speed, you get all the advantages of square, clean, burrless cutting *without waste* . . . For the very best results, use the M. & M. Automatic Saw Grinder and Segmental Saw Blades.

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THE MOTCH AND MERRYWEATHER MACHINERY CO
CLEVELAND DETROIT
CINCINNATI PITTSBURGH

trailer is designed so that mounting is merely a job of placing four bolts in the frame of the trailer which register with the four holes in the welder legs. This arc-welded steel unit weighs 120 pounds and has an overall height and width of 45 and 44 inches respectively. It also is equipped with jumbo 4-ply tires.

Potentiometer

■ Rowe Radio Research Laboratory Co., 4201 Irving Park boulevard, Chicago, announces an angular sweep potentiometer, a device which permits correlation of the angular position of any shaft connected to it and the beam position of an oscillograph. Practically any oscillograph may be employed to obtain this "angular sweep". Shaft speeds of anywhere from actual 0 to 20,000 revolutions per minute are allowable and a static calibration holds perfectly even at the highest speeds.

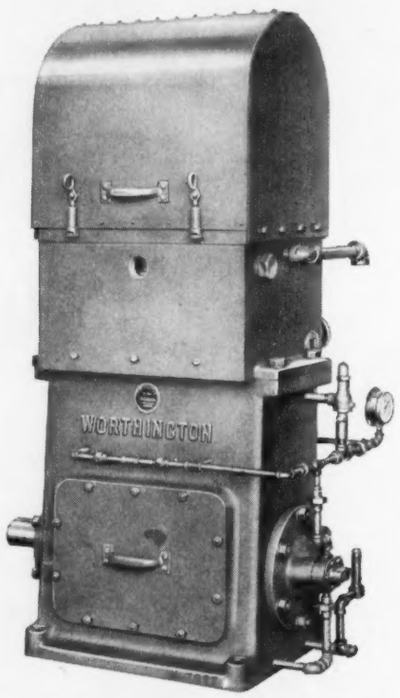
Horizontal Pumps

■ American Manganese Steel Division, American Brake Shoe & Foundry Co., Chicago Heights, Ill., has placed on the market new types A and T horizontal pumps for operating heads up to 100 feet. They are offered in all sizes from ¾ to 6 inches in capacities up to 1400 gallons per minute.

Featuring clamp-bolt construction of the water end, the pumps are fabricated in a variety of materials to meet specific requirements. In addition, four types of impellers are available—2, 4 and 6-vane shrouded type and 4-vane open type.

Power Pump

■ Worthington Pump & Machinery Corp., Harrison, N. J., announces a new high pressure vertical triplex power pump for pressures up to 9800 pounds and capacities up to 51 gallons per minute. Available in eight sizes, it is suited to applications where small capacities and high pressures are required, as for the operation of hydraulic presses, manufacture of plastics, for roll balancing in steel mills and, to an appreciable extent, in oil refineries on special process work. The pump



has no gears and is for use with a built-in gear head motor, although it can be arranged for V-belt drive. One of the important features of its construction is that its plungers are outboard and there is a dry joint between the liquid cylinder and power frame.

Ram-Tapering Mechanism for Presses

■ Steelweld Machinery Division, Cleveland Crane & Engineering Co., Wickliffe, O., is now incorporating a ram-tapering mechanism on its line of bending presses. This enables making conical sections without use of special dies, work being done with standard bending dies.

Cutting SHELL STOCK, ROUNDS, SQUARES AND FLATS Without Let-Up!

"Buffalo" Billet Shears are powerful production tools, built to handle stock on a rapid 24-hour-a-day schedule. Many are in use cutting shell-stock, tank and tractor stock—one of our many contributions to national defense.

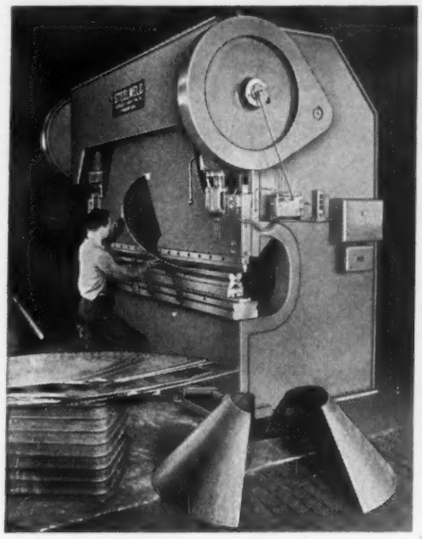
Frames are electrically welded, built of "Armor-Plate" steel. Easy to control, economical to operate. Eleven standard sizes for cutting rounds up to 10" and squares up to 9".

BUFFALO FORGE COMPANY
446 BROADWAY
BUFFALO, NEW YORK
CANADIAN BLOWER & FORGE CO., LTD.
Kitchener, Ont.

BULLETIN 3295
will be sent on request.

"Buffalo" BILLET SHEARS

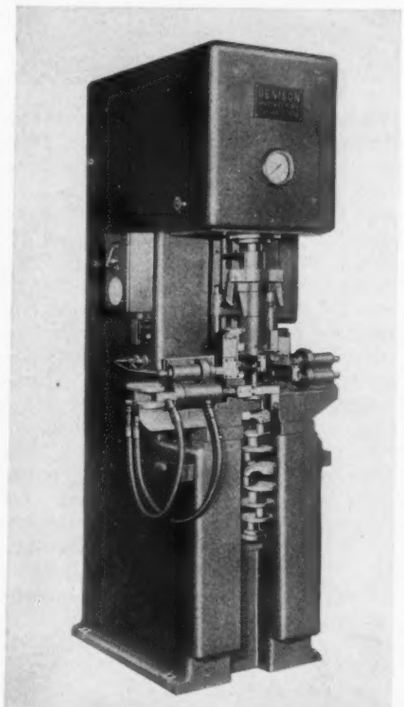
Tapering the ram is simple. It is only necessary to operate the ram-tapering lever which disengages the ram clutch. This permits operation of the right-hand ram screw only, which raises or lowers the right end of the ram producing taper. Either



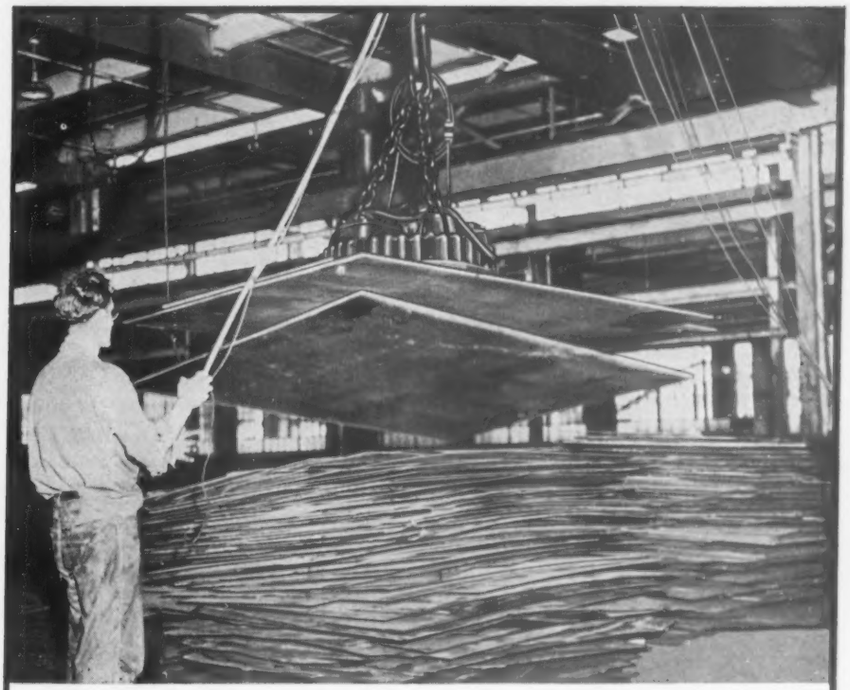
end of ram can be tapered as much as ¼-inch per foot length of bed. The ram swivels on trunions in the slides. Press illustrated is shown working steel 3/-6-inch thick.

Crank-Shaft Press

■ Denison Engineering Co., Columbus, O., has introduced a special modification of one of its standard



presses known as a Hydroilic press for assembling keys and timing gear on automobile crank shafts. Of 5-ton capacity and entirely automatic, it is so arranged that if the



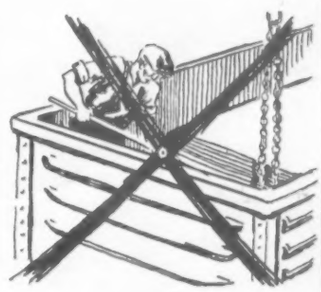
UNLOADS—SORTS and MAKES-UP ORDERS FASTER and SAFER with EC&M LIFTING MAGNET

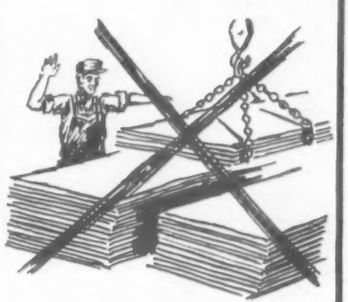
TO speed up both incoming and outgoing shipments of steel plates, this company has found that an EC&M Type SA Lifting Magnet does these tasks quickly and safely. All manual labor with plate handling has been eliminated.

There is no lost time in prying apart plates to affix chains—no danger of crowbar or chain slippage.

Sorting plates into piles as well as making up orders is also quickly accomplished. Single plates may be picked up or two or more plates may be lifted as needed. If more than the required number are lifted, the operator, by rapidly manipulating his master switch controlling the EC&M Automatic-Discharge Magnet Controller, has become skilled in dropping off plates one at a time until the lift contains the required number.

This is only one of the many ways in which EC&M Type SA Lifting Magnets help speed defense operations. Write for 18-page illustrated Bulletin 900 showing them at work. Fill out the convenient coupon below for your copy and mail it today.





THE ELECTRIC CONTROLLER & MFG. CO. CLEVELAND, OHIO

HEAVY DUTY MOTOR CONTROL FOR CRANES, MILL DRIVES AND MACHINERY • BRAKES • LIMIT STOPS • LIFTING MAGNETS AND AUTOMATIC WELD TIMERS.

THE ELECTRIC CONTROLLER & MFG. CO.
2700 E. 79th St., CLEVELAND, OHIO

Gentlemen:
Please send me a copy of illustrated Bulletin 900 describing EC&M LIFTING MAGNETS.

Name .....

Company .....

Address .....

timing gear does not fit, the pieces are rejected. The crank shaft is locked in place and the keys fed into the press through magazines. Four cylinders assemble the two keys, and the timing gear is pressed into place by the ram. A special safety feature halts the operation of the ram if the keys are not pressed into place properly.

Hammer Heads for Soft Metals

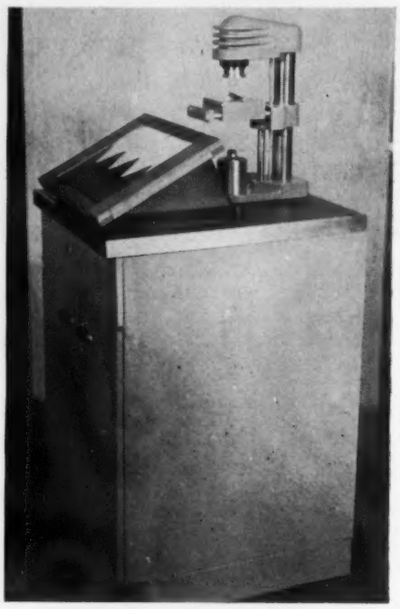
■ R. & R. Plastic Products Co., West Springfield, Mass., has introduced a new line of hammers featuring heads of plastic made from the Du Pont material Pyralin. These according to tests, do not chip or break and do not mark silver, gold, pewter, brass, copper, aluminum or similar metals. In addition, they do not absorb water, oil or grease and do not deteriorate with age. The hammers are suitable for use by machinists and metal workers of all types.

Oil, Water Extractor

■ Binks Mfg. Co., 3114 Carroll avenue, Chicago, has introduced a new large capacity E-75 oil and water extractor which has a rated capacity of 75 cubic feet per minute at 60 to 70 pounds pressure. Designed to handle the air needs of several modern spray guns at low or high pressure, it has two main line air outlets, as well as two regulated air outlets. In addition, it incorporates a new air cleaning principle. An improved large capacity air regulator also is part of the unit.

Optical Projector

■ Portman Machine Tool Co., 17 Beechwood avenue, Mount Vernon, N. Y., has placed on the market a new optical projector for use in shop, toolroom, laboratory or production departments. Objects to be

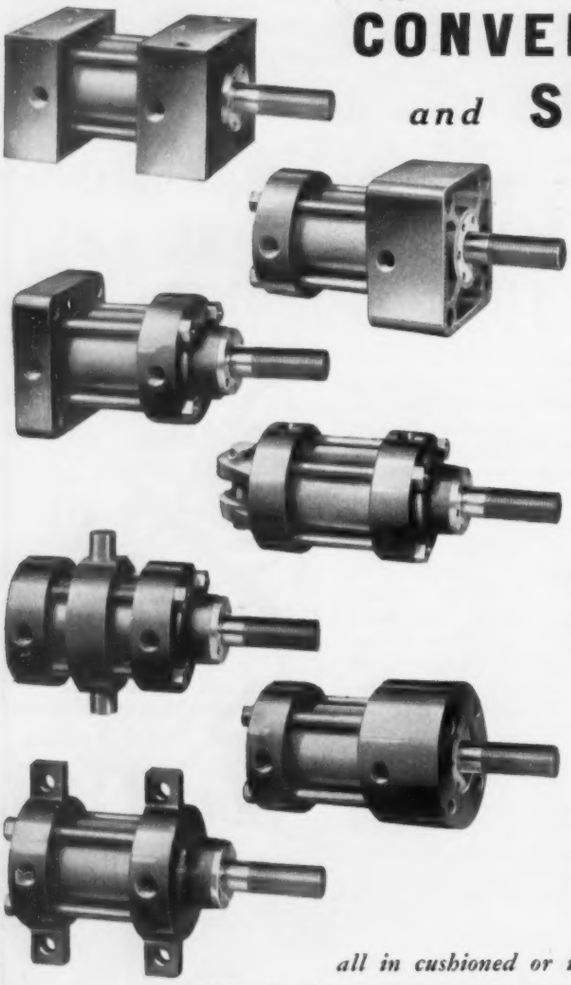


measured, inspected or compared are simply placed on the work rest member of the stage. Among features embodied in the unit is the utilization of the action optical system. This permits ready change of image magnifications. The projector is offered with plain type stage unit or may be equipped with a coordinate type staging unit consisting of movable members for sidewise and forward travel. The coordinate stage includes dial type indicators reading in 0.001 for rapid visual detection of object errors. The reflected image is projected on a clear or ground glass screen. As there is but one adjustment to be made in operating the projector, inexperienced operators may be employed for the most critical inspection operations. Standard magnifications available are 10, 20, 30, 45, 60, 80 and 100.

Straightness Indicator

■ Baldwin Southwark Division, Baldwin Locomotive Works, Eddystone, Pa., has introduced an induction-type device for indicating ec-

POWER MOVEMENT
applied
CONVENIENTLY
and **SIMPLY**



In a direction parallel with the mounting which may be vertical, horizontal or on any angle.

Perpendicularly from the mounting either from the piston rod end or the blank end.

From an end swivel point or from intermediary swivel points.

Perpendicularly from a piloted mounting or from between supports.

all in cushioned or in non-cushioned types.

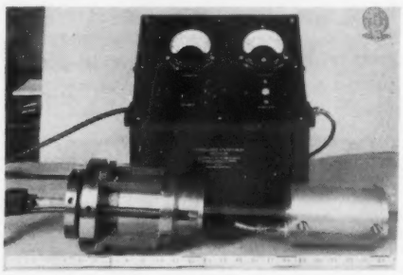
● It will aid in more prompt deliveries, if these standard designs are used. These can be furnished with the least amount of personal attention, requiring no delaying special material requisitions or manufacturing provisions that are necessary for special designs.

Hydraulic Cylinders are shown. These are described in our Catalog H-40. Similar designs are available for compressed air use.

this is a **TOMKINS-JOHNSON** *product*

611 North Mechanic Street **Jackson, Michigan**

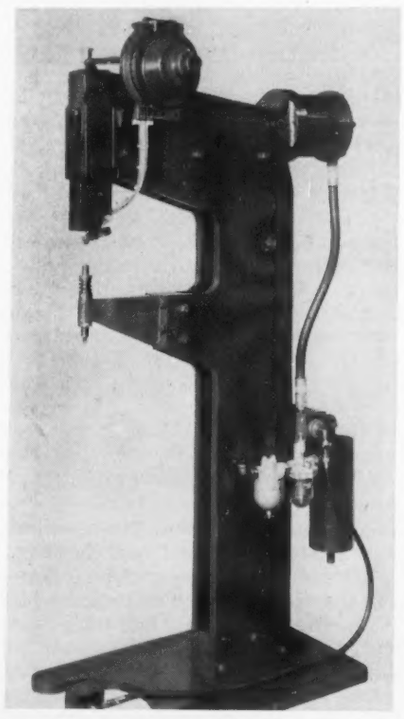
centricity in tubes and gun barrels. Known as the Haskell gun bore straightness indicator, it is a self-contained unit designed to be fitted to the ends of a gun barrel while the latter is being straightened in a press. The instrument is said to provide a fast and accurate indication of the eccentricity. By using extra accessories, a number of bore diameters can be provided for. The



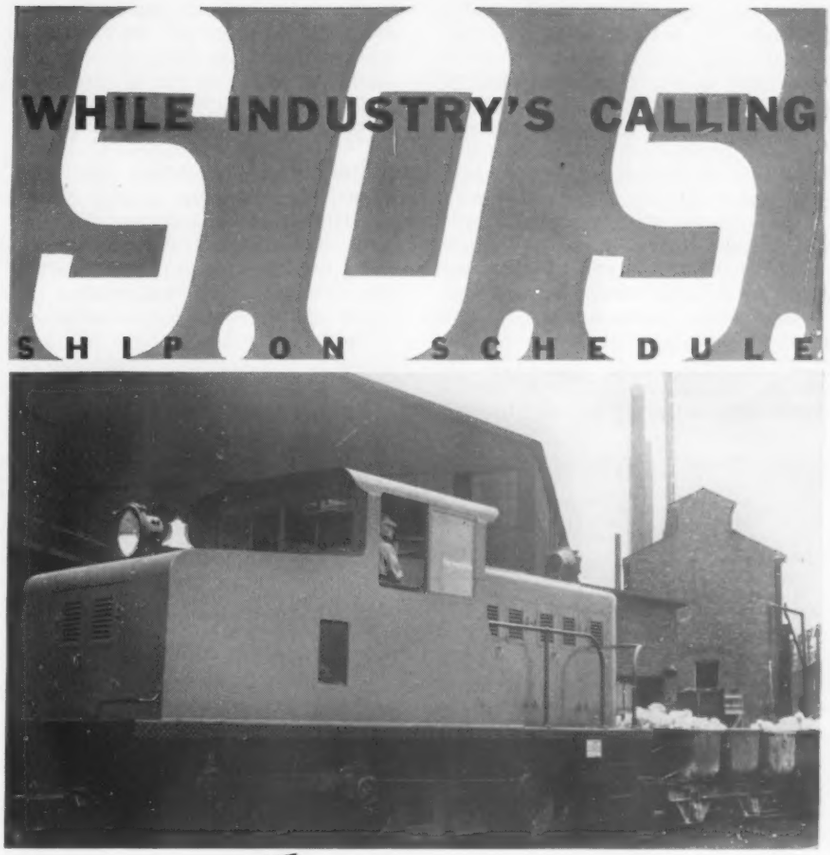
maximum is fixed by the facilities available for handling and rotating large gun barrels. With care, the device will detect an eccentricity of 0.005-inch or less, accuracy depending on the concentricity of the roller tracks with the ends of the bore. The equipment can be connected to any alternating current lighting unit and is available for both cold and hot straightening operations. Sizes are offered from 37 millimeter upwards.

Rivet Machine

■ Tomkins-Johnson Co., Jackson, Mich., has placed on the market a new type production rivet setting



machine for use in the aircraft industry. It is capable of setting up to ¼-inch diameter by ¾-inch long



FLEXOMOTIVE will help you to SPEED PRODUCTION and SHIPPING

To keep production at capacity, answer industry's S.O.S., materials and finished goods must be moved in vastly greater tonnage, moved with considerably greater speed! Let Flexomotive handle the job! In the yard switching incoming or outgoing cars, "spotting" them for speed, convenience; at the furnaces hungering for ore; moving tremendous loads from factory to yard, or between plants . . . Flexomotives have the speed, power and flexibility to move many more tons per day, and *faster!* Put a Flexomotive to work in *your* plant. See how this No. 1 performer of the industry will help you establish new records for speed, capacity, econo ny.

PLYMOUTH FLEXOMOTIVES ARE FIRST IN—

ECONOMY 20% less fuel; lowest maintenance cost ever recorded for full powered locomotive.

POWER Outpull any other diesel of equal size and horsepower; Plymouth 45-ton Flexomotive outpulled a 65-ton steamer on same job.

EFFICIENCY From 83% to 88% average over entire speed range.

AVAILABILITY 95% to 97% availability in 24 hour service.

FLEXIBILITY Instant variation of speeds to meet a wide range of work requirements and conditions. Finger-tip control.

RUGGEDNESS Most ruggedly built internal combustion locomotive in America.

HERE'S PROOF:

Record of Flexomotive performance in continuous 24-hour service proves that "Flexomotives Are First." Every plant and production manager should read it. Write today—it's free!

PLYMOUTH LOCOMOTIVE WORKS, Division of THE FATE-ROOT-HEATH COMPANY, Plymouth, Ohio

PLYMOUTH Flexomotive
DOLLAR FOR DOLLAR
THE GREATEST DIESEL LOCOMOTIVE EVER BUILT

aluminum alloy rivets. On this unit, pressure for setting rivets is furnished by an air cylinder, air pressure from this source being applied (and stepped up) through a toggle mechanism. This action is combined in the machine with an automatic feed feature which has before this been used largely only on electrically powered riveting equipment. An added feature is that, through use of a different type of rivet set and jaw construction, the machine is capable of doing a good job of flush riveting. Machines are now available in 9, 12, 14, 16, 18, 20, 22, 24, 28, 30, 32 and 36-inch throat depths with a ram stroke of 3 inches. Each unit uses air pressure at 60 pounds pressure per square inch, however, less pressure may be utilized depending on the rivet size.

Mitering Attachment

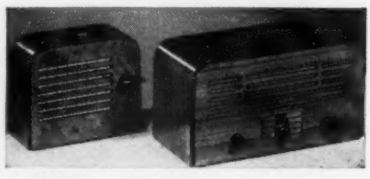
■ Continental Machines Inc., 1301 Washington avenue, South, Minneapolis, has placed on the market a new all-purpose mitering attachment for facilitating ripping, cutting off, and mitering operations. All three operations are performed on a single unit adapted to either manual or power feeds. Attached to the front instead of the side of the work table, on a sectional guide for full table coverage, the mitering attachment does not interfere with removal of filler plate. It is attached to slide rods and carried by the slide rod bracket mounted on the above guide. A removable guard prevents sawing into the mitering head. Manual operation is accomplished by a 6-inch hand wheel through a screw which engages an internally threaded tube on the slide rod bracket for feeding mitering head directly toward the saw. The mere disengagement of the internally threaded tube is required in power feeding.

Shovel Truck

■ Pollard Bros. Mfg. Co., 5503 Northwest highway, Chicago, has placed on the market a redesigned No. 500 shovel truck which is capable of picking up barrels and boxes easier. Main truck body is strengthened so that loads heavier than 500 pounds can be transported without fear.

Communication System

■ Allied Radio Corp., 833 West Jackson boulevard, Chicago, announces a 1942 innovation in intercommunication systems—the Knight superselective—to meet requirements of the modern industrial plant. It offers complete privacy of conversation between executives or customers—silencing of substations when not in use. In most installations any voice will carry over 50 feet. Workmen may answer without leaving the assembly line or their bench. The system has a 2¼-watt power output, enabling ten substations to carry five simultaneous 2-way conversations. Up to 2000 feet of cable may be used between each station. The development operates from 110-115-volt alternating or direct current.



Pattern FOR A BOMBER

Months before a new-model bomber is wheeled off the construction line, it is "born" in the loft of an aircraft plant. Here busy draftsmen lay out templates to insure hair-line accuracy in the finished plane.

Many of these templates are made of ARMCO Galvanized PAINTGRIP sheets. Draftsmen in aircraft plants like PAINTGRIP because it assures a workable surface, does not smudge, and is easily *painted* if desired. Extra wide sheets are available.

ARMCO PAINTGRIP is a bonderized zinc-coated sheet. Unlike ordinary galvanized metal PAINTGRIP *takes* and *preserves* paint. It needs no pretreatment and the bonderized film insulates the paint from the zinc.

Airplane templates are only part of a growing list of "defense" uses for ARMCO Galvanized PAINTGRIP. New buildings, aircraft hangars, rolling doors, radio car bodies and bakery ovens for the army are a few others. Now is a good time to learn more about this unique galvanized sheet for your future needs. Just write The American Rolling Mill Co., 3121 Curtis St., Middletown, O.

ARMCO PAINTGRIP

New Furnace

(*Concluded from Page 72*)

These furnace panels are heavily reinforced, both horizontally and vertically, but through metal is almost entirely eliminated. Special telescopic joints on the panels automatically take care of contraction and expansion and keep the furnace tight at all times. With this type of construction, the process of fabricating a furnace is greatly expedited. Also assembly and installation can be done much more easily and quickly.

The panels are fabricated at the factory and then sent to the desired location. There it takes only eight days to assemble completely the furnace, including the heating system, the temperature and safety controls, the heat-distributing and air circulating system, and the car system. Then it is ready for immediate operation. Should the furnace have to be moved to another location due to revamping of the production line or enlarging of the plant, it can be knocked down easily and reassembled in a very short period of time.

Easy To Enlarge Furnace

On the other hand, if the production requirements demand a larger furnace, it is easy to increase the capacity of the furnace merely by adding necessary panels and increasing heating capacity.

Another outstanding feature of this new furnace is the external indirect gas-fired heating system. The radiant-tube forced-convection heating system on top of the furnace is important because it permits all types of aluminum alloy castings to be processed properly. It is especially adapted to jobbing foundries and for the use of many others which must process all types of aluminum alloy materials that require indirect heating.

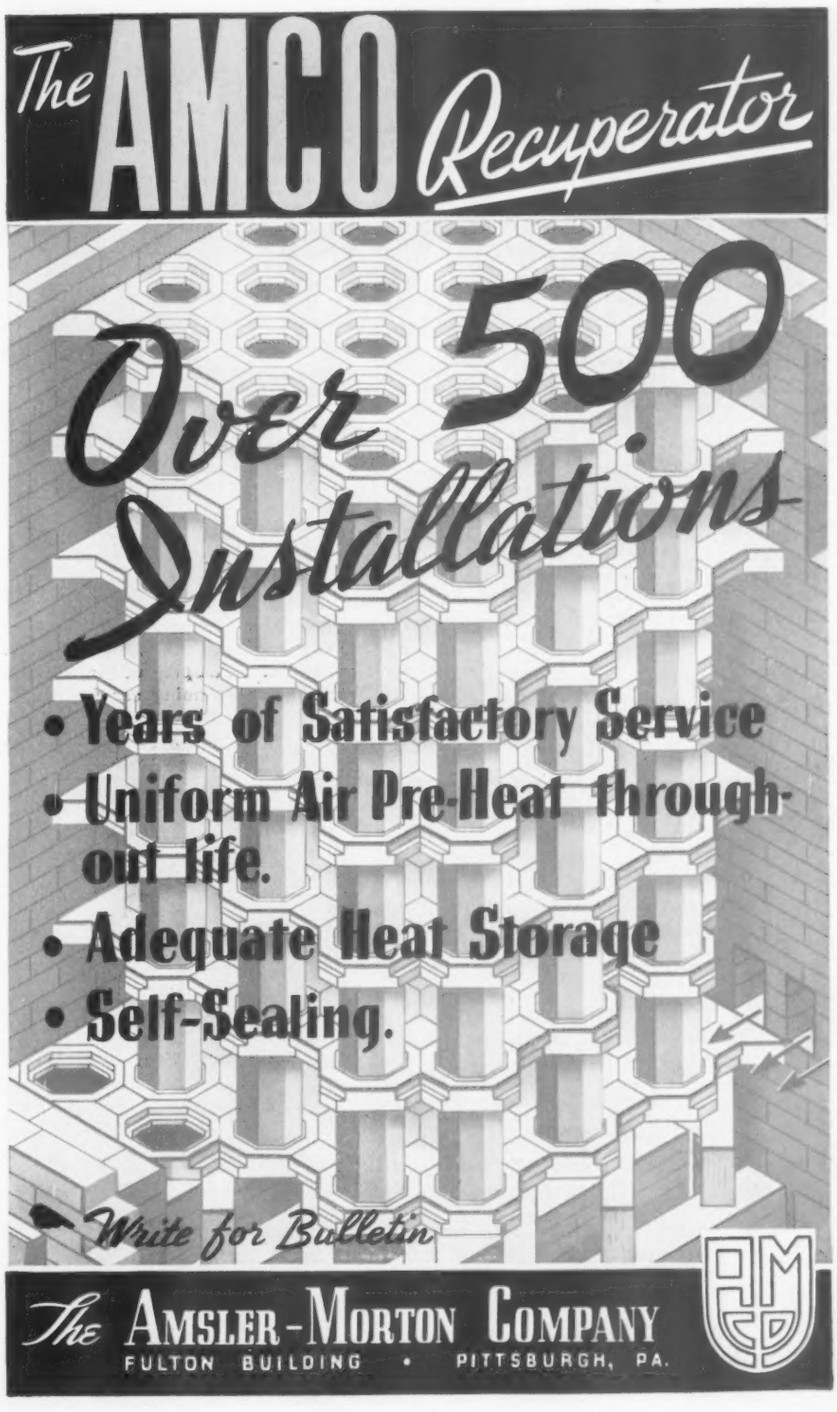
By having an external heater, all radiant heat is completely eliminated from the interior of the furnace. This condition is most essential and desirable for furnace operating temperatures up to 1000 degrees Fahr. A large high pressure alloy-steel fan delivers heated air to the work chamber at a velocity approaching a 60 or 70-mile-per-hour gale, affording rapid and uniform heat transfer.

Heated air is distributed into the working chamber through stainless steel ducts placed along the sidewalls and bottom of the furnace. Each duct is provided with ports and adjustable slide dampers. Recirculation ducts are arranged in a similar manner in the top of the furnace. The furnace is claimed to produce an interior temperature uniform within plus or minus 10 degrees Fahr. throughout. Both temperature uniformity and temperature control accuracy are vital to assure the greatest maximum tensile strength and also greatest elongation factors in the aluminum alloy castings.

Operating costs are low. Tests show the maximum gas consumption is 27 cubic feet of 1100-B.t.u. gas per minute.

Temperature range is from 300 to 1000 degrees Fahr. Since the furnace is operated continuously night and day, it is up to temperature at all times. When a cold load is inserted the furnace temperature drops 400 to 500 degrees Fahr. The input capacity of the heating system, however, has been preadjusted so that the castings are brought up to temperature in about 6 hours or less, or within whatever given time may be specified.

Heavy-duty construction is used throughout, especially designed for the most severe service possible. The radiant tubes in the heating system are constructed of a special high-chromium alloy which should give about five years' service.



Air Conditioning

(*Concluded from Page* 94)

humidity for 1941 showing the maximum, minimum and average for natural air, it will be noted that the conditioned air for the month of June was 3.351 grains; July, 3.642 grains; August, 3.499 grains; and September, 3.251 grains. In all cases the moisture content was over 3 grains due to the fact that when the precompression chilled water system was installed only one compressor was guaranteed to maintain 4 grains for June; 5 for July; 4 for August; 4 for September; and 4 for October. For the rest of the months of the year, 3 grains was assured.

Since the application of the air-conditioning system the furnace has operated more smoothly, drives more regularly and keeps a more constant wind blowing. In addition there is a more uniform heat, and a more uniform burden which, in turn, gives a more uniform temperature of iron and a more uniform analysis for all our steelmaking units.

Because of these advantages the Jones & Laughlin Steel Corp. has installed similar air conditioning equipment on two furnaces at its Pittsburgh works, making a total of three now operating under controlled blast.

Although there was no doubt in the minds of the operating men that air conditioning equipment had effected a substantial improvement in the performance of No. 1 blast furnace, it was decided, in order to obtain more conclusive data, to transfer the conditioned air from No. 1 to No. 3 stack during the first half of September and again put it back on No. 1 stack during the second half of the month.

Immediately after switching the conditioned air from No. 1 to No. 3 furnace, the production of No. 1 dropped off and the production of No. 3 increased correspondingly; that is, No. 1 decreased 141 net tons or 14.5 per cent for the 13-day period, while No. 3 increased 134 net tons or 13.9 per cent. For the second half of the month, the conditioned air was switched back to No. 1 furnace and it immediately recovered the production lost and the production of No. 3 furnace decreased correspondingly.

Equipment Inspected Hourly

No separate attendant is required for the air conditioning equipment as this work has been added to the duties of the blowing engine room turn foreman. He looks over the air conditioning equipment once each hour and his rate of pay has been increased to compensate for the additional responsibility.

There are no delays involved in conditioning the blast air; the only delays experienced are those which ordinarily occur in blast furnace operation without air conditioning equipment.

For the first six months the amount of steam saved on the turboblower in operating No. 1 furnace on conditioned air was the equivalent of 2,900,000 kilowatt hours. This, in turn, more than offset the operating cost of the air conditioning unit, after taking into account the loss of heat in the air entering the stoves which was at a lower temperature.

While the average increase in iron production was 16 per cent during the summer months, June to September, inclusive, on the one furnace equipped with a pre-compression chilled water system at the Aliquippa works, it is expected that with the winter months included, the average increase in production throughout the year will be not less than 8 per cent. A reduction in coke rate can also be claimed, which is approximately 4 per cent.

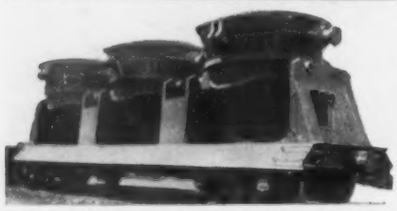
Some blast furnace operators are of the opinion that an increase on a 3 grain system is questionable and that it is necessary to go to 1 grain of moisture to get any real results.

News of Industry

Forecast—Faster Production with Probable Savings

KOPPEL CARS SPEEDING DEFENSE PRODUCTION

100-Tons Capacity Ladle Car



Triple cylinder, or smaller, of largely welded construction for steel plant service.

OVER 75 TYPES IN KOPPEL LINE

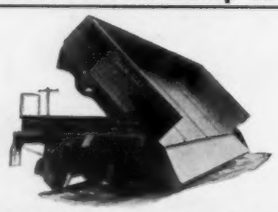
KOPPEL

There are over 75 types of KOPPEL cars for moving any material on wheels. Let us send you Bulletin No. 71 describing the complete KOPPEL line of industrial cars to help speed your defense orders. Write today for full particulars!

. . . Plant Owners Report Savings in Time and Labor with Koppel Industrial Cars

"You can't beat KOPPEL cars when it comes to hauling more material at lower cost," say plant owners throughout industry. These ruggedly built industrial cars move bigger loads faster and at less cost. High carrying capacity, combined with quick, clean dumping action, makes KOPPEL the outstanding car for every industry. Bulletin No. 71 gives complete details.

Automatic Air Dump Car



Has increased waste disposal efficiency 60%, and cut initial cost 27% below that of ordinary equipment.

KOPPEL STRESSES FIVE FEATURES OF ITS CARS

1. High Pay Load Capacity
2. Quick, Clean Dumping Action
3. Rugged Durability
4. Minimum Maintenance Per Ton
5. High Tensile and Abrasive Resistant Steel Construction when Desired.

Write for Bulletin No. 71

Many KOPPEL Cars For Steel Plant Use

PRESSED STEEL CAR CO., Inc.
(KOPPEL DIVISION)
PITTSBURGH, PENNA.

Based upon the experience of six months' actual operation of the No. 1 Aliquippa blast furnace, it would appear that a greater percentage of the maximum tonnage that can be expected, will be produced from a 3-grain system.

However, at this time, the author is not in a position to say that by maintaining a moisture content below 3 grains, more tonnage or lower coke consumption can be realized, but he is of the opinion that if the furnace is blown with air carrying less than 3 grains of moisture it will have a tendency to hang and work on a higher pressure and will not produce as good a quality of iron. However, by next spring we should have a definite answer on this question since the three 1-grain air conditioning systems now being installed in other plants will have been completed.

It would seem that air conditioning equipment offers the steel industry the most attractive means of increasing iron production in the interest of National Defense, and the equipment can be installed in a comparatively short time compared to building additional furnaces or beneficiating raw materials to increase production.

How Armco Developed High Business Ideals

■ *True Steel,* by Christy Borth; cloth, 319 pages, 6 x 8¾ inches; published by Bobs-Merrill Co., New York, for $3.

This is a story of George Matthew Verity and his associates, who are the moving force behind the American Rolling Mill Co., Middletown, O.

It is refreshing to read, at last, a story of steel and its making that all is sweetness and light. Too many writers on the history of the industry have been impelled to drag in every unsavory fact and condition, however remote from the subject under consideration. Nothing of the sort attaches to the Armco group and this contribution makes pleasant reading.

Taking a running start the author goes back to George M. Verity's parents and to his birth as the funeral cortege of the martyred Lincoln wended its way westward, and as the first discoveries of iron ore in the Northwest were being made. Of a churchgoing Godfearing stock came this man who carried the ideals of his forbears into his business, where they still stand as a pillar of the business.

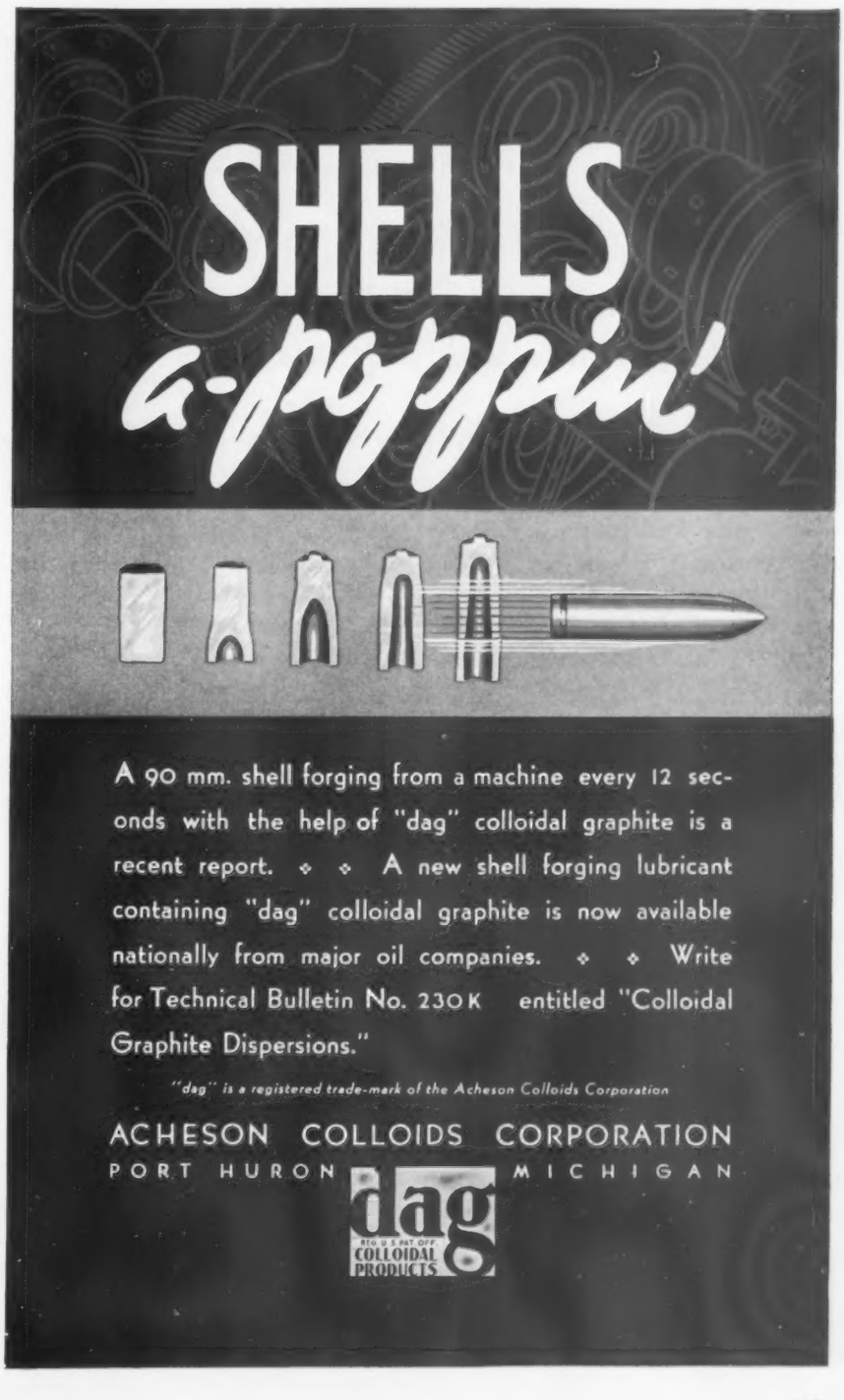
The story carries the development of the Verity business from its beginnings in a sheet metal roofing plant that needed a manager, down through the years of achievement that have made Armco a name to be reckoned with, including development of the continuous sheet mill.

New Plating Process Is Defense Aid

■ Waste metals instead of new metals may be used for plating steel by utilizing a new method reported by Hanson-Van Winkle-Munning Co., Matawan, N. J. Advantage of the Hubbell-Weisberg process, as it is known, lies in its ability to use cheap sources of zinc instead of zinc anodes in electroplating, thereby releasing new metals for defense purposes.

The process is reported to produce zinc coated wire or strip which is equal to that produced by other zinc plating methods. Steel handling, pickling and cleaning are the same as for other processes. The plating tank, however, is specially designed to take advantage of the fact that anodes seldom have to be changed, and to provide covers which prevent escape of ammonia fumes and at the same time permit easy rethreading of wires or strips.

The outstanding value of the process lies in the savings due to the low cost of the zinc going into the plating operation. Savings possible by the use of the Hubbell-Weisberg process have been estimated at as much as 3.5 cents per pound of zinc deposited.


SHELLS
a-poppin'
A 90 mm. shell forging from a machine every 12 seconds with the help of "dag" colloidal graphite is a recent report. ⋄ ⋄ A new shell forging lubricant containing "dag" colloidal graphite is now available nationally from major oil companies. ⋄ ⋄ Write for Technical Bulletin No. 230K entitled "Colloidal Graphite Dispersions."
"dag" is a registered trade-mark of the Acheson Colloids Corporation
ACHESON COLLOIDS CORPORATION
PORT HURON MICHIGAN
dag
REG. U.S. PAT. OFF.
COLLOIDAL PRODUCTS

How To Do More . . .

(Concluded from Page 70)

—Complete drawings of single pieces in full detail with definite tolerances on each measurement and specification.

—Shear charts showing how to cut the piece out of the sheet specified.

—Bill of material covering all items required—list to be used as a material requisition.

—The operations involved and their sequence.

—The department in which the job will be done.

—The equipment or work stations to be used.

—Incentive allowance for the set-up and for each operation.

—Scheduled date for each operation.

With the information at hand, it would guarantee that all details necessary for accomplishing the work were available, thus eliminating the preparation work involved each time a job was repeated in the shop.

This was found to be an enormous job. Trained people were not available to record the information, but it was found that by using the most flexible sheet metal workers in cooperation with the most flexible draftsmen, it was possible to produce shop drawings with everything on them.

This at once eliminated five of the eight skilled jobs of the sheet metal worker as it no longer was necessary for him to make a layout, design joints and determine construction, select operations and their sequence, select equipment, plan the job. This left then only three of the eight operations to be done by workmen in the shop. Thus it only remained for the workmen to:

Set up tools, presses, brakes, shears, etc. This in reality did not require a sheet metal worker but rather a specialist familiar with dies, tools and machinery. These men in most cases are trained from helpers and handy men in the shop.

Machine Operating. This again does not require a sheet metal worker as new men can be trained in a short time to operate specific tools without attempting to make them capable of running all the sheet metal working tools in the shop.

Assembly Work. Since this is largely a matter of putting parts together in accordance with a predetermined plan, these men are easily trained from new employes of average intelligence in a short time.

This analysis and schedule made it possible to use the highly skilled sheet metal workers as foremen, gang leaders, setup men, instructors, layout men and methods men.

In this way we found it possible to:

—Increase greatly the ratio between nonskilled and skilled employes.

—Increase the productive capacity of the shop as a whole.

—Decrease by 20 per cent the amount of supervision required in instructing the men how to do the job since the drawings now are simple and complete.

—Simplify materially the job of making time studies.

—Decrease the time required for setting rates by 28 per cent. This increased incentive coverage from 30 to 97 per cent and thus improved production through improved worker effort.

—Make it possible to find and locate interchangeable parts on various units that could be built in stock lots. On some pieces the setup time was 10 to 20 times greater than the operation time due to the small quantities involved. This situation was materially improved by bringing through stock lots of interchangeable parts for many of the products.

—Reduce inspection time by approximately 25 per cent.

—Simplify planning and scheduling activity to a point that permitted it really to work.

It is thought that a similar analysis of the operations in many

AVOID DELAY IN FURNACE CONSTRUCTION

Use Refractory Concrete!

...It is available and adaptable

YOU can get the materials for Refractory Concrete and Refractory *Insulating* Concrete *now*—or whenever you want them. Refractory Concrete is made with LUMNITE as the binder for refractory aggregates. LUMNITE is sold by building supply dealers throughout the United States and in Canada. Aggregates *can be easily obtained or prepared in your plant.*

Added to availability is the adaptability of Refractory Concrete and Refractory *Insulating* Concrete. *This also eliminates delay.* Cast-in-place Refractory Concrete is formed to fit the job. Any thickness or shape of wall or arch can be placed without limitation by the size of masonry units, without cutting, and without waiting for special shapes.

High cold-strength speeds up the construction schedule. Refractory Concrete is ready for service in short order, usually before installation of burners and accessories is completed. *You do not have to wait for Refractory Concrete.*

Pre-cast units of Refractory Concrete can be made in your plant, ready for installation as needed. Special shapes, made in any form desired, can be stored or installed the day after molding—without pre-firing.

Let us tell you where you can get LUMNITE and aggregates for Refractory Concrete and Refractory *Insulating* Concrete. Write Atlas LUMNITE Cement Company (United States Steel Corp. Subsidiary), Dept. S-20, Chrysler Bldg., New York City.

Keep LUMNITE Castables in Stock— if you prefer a factory-prepared mixture. Made with LUMNITE and selected aggregates, these castables are ready for use upon mixing with water. With LUMNITE castables you can have Refractory Concrete or Refractory Insulating Concrete in minimum time. LUMNITE Castables are obtainable from refractory manufacturers and distributors in all parts of the United States and Canada.

▶ Specify Castables "Made with LUMNITE" ◀

LUMNITE FOR REFRACTORY CONCRETE

shops might result in a simplification and a breaking down of the overall jobs to great advantage—especially when it becomes necessary to increase the volume of work handled by adding new men. Thus the training period becomes shorter, and men are put in production much faster.

Pulsating Flow

(*Concluded from Page* 82)

into the chamber, where the pulsations cause the compressed air to contract and expand alternately. The pulsations are thus absorbed in the chamber and allow accurate readings to be obtained with the flow meter. This arrangement also is suitable for use in measuring liquids other than water.

In measuring a compressible fluid such as steam, air or gas, satisfactory results are attained by installing sufficient receiver capacity and causing the fluid to undergo one or more abrupt velocity changes. This allows the fluid to compress and expand in the receiver space and consequently damps out the pulsations. If a large receiver is not available, "throttling orifices", Fig. 3 p. 82, may be used to produce velocity changes. These may be constructed economically of thin sheet metal and inserted between flanges in the line. This method, however, results in a pressure loss which is not recoverable, and therefore the use of a receiver may sometimes be preferable. Neither of these methods is available for measuring water or other liquids, since these fluids are practically incompressible.

Design Trends

(*Continued from Page* 102)

of a commercial scheme, designers in the past have been reluctant to impose their aesthetic standards upon the public. Because the designer is required to do just this at present, the public is already welcoming the simpler, cleaner product that is available.

The fact that shortages of various materials have developed progressively has imposed added difficulties on the task of selecting substitutes. For example, when it first became apparent that aluminum must be replaced in the manufacture of refrigerator ice trays, brass appeared as a likely alternative. Then brass supplies tightened as a consequence of the zinc situation. A copper tray with a rubber grid would suffice, but here again prospective scarcity intervened and the next choice becomes tin-plated steel or an all-rubber tray—as long as rubber can be had.

Stainless steel likewise is out as material for refrigerator shelves. Glass is a desirable substitute but costly. Plated steel provides another answer. Certain stainless steel parts on domestic ranges also must bow to substitutes—enameled steel, for instance, in the case of the cooker in the electric range. Plastics will supplant a certain amount of bright metal formerly used.

Brass name-plates likely will become less plentiful on domestic articles, but for some applications a satisfactory paper substitute is available.

A further development of unusual interest is the use of gold plating in commercial uses. Two years ago I had already started to find practical applications for the huge stocks of gold available. Since 1940 approximately 965,000 units (door handles and nameplates) which I design have been gold plated where chromium or enamel finishes might have been specified. Today, gold plating is practically as economical as chromium plating in many uses. The return of gold in subdued, buffed finishes, lightly applied, will add greatly to the beauty of simple design.

While the designer does not claim

NOPAK 3- and 4-Way Hand Operated Control Valve

NOPAK Shut-off Valve Quick or Throttling Action

NOPAK Type R Foot Operated 3- and 4-Way Control Valve

NOPAK Air or Hydraulic Cylinders, Self-Regulating or Adjustable Cushion, 6 Standard Mountings

There's Nothing Unusual About This Telegram

Rush orders for standard NOPAK VALVES can generally be shipped from stock.

A special service for exceptional times? No — just regular NOPAK service stepped up to meet today's urgent needs. A large inventory of finished valves and standardized interchangeable parts makes this possible.

If your requirements call for shut-off valves, or 3- and 4-way operating valves, in hand or foot models, for pipe sizes from ⅛" to 2" and pressures up to 500 lbs., — chances are that they can be shipped at once. To eliminate doubt, ask your NOPAK representative or wire Galland-Henning, Milwaukee, for a delivery date.

NOPAK Valves save you money, too, because they are leakproof and wearproof — actually improve with use, require no maintenance. If you are not familiar with the famous NOPAK Rotating Disc Principle, write for literature at once.

Two Weeks' Delivery On "Standard" Cylinders

Because specifications for NOPAK Air or Hydraulic Cylinders vary with every order it is impossible to carry finished cylinders in stock. However, it is usually possible to ship *standard brass tubing cylinders*, in ordinary sizes, within two weeks from date of order.

GALLAND-HENNING MFG. CO.
2747 S. THIRTY-FIRST STREET • MILWAUKEE, WISCONSIN

Representatives in Principal Cities

NOPAK VALVES and CYLINDERS
DESIGNED for AIR or HYDRAULIC SERVICE

ADVERTISING PAGES REMOVED

that in all cases a superior product results because of the necessity of supplanting a strategic metal with some other material, he does believe that design will benefit by the present emergency. The designer, prepared as he is to handle all phases of the large problem ahead, knows that the very conservation of materials now means the freeing of them in tremendous quantities eventually. For instance, witness the huge expansion in aluminum producing capacity to far in excess of previous peacetime consumption. The availability of cheap aluminum and magnesium alloys may bring about a design revolution in the transportation field. Automobile bodies, truck cabs, trailers and railroad freight equipment are going to be affected as well as refrigerators, household appliances, and possibly pre-fabricated dwellings.

If design in all manufacture is organized in advance, there is no reason why the eventual flooding of markets should prove detrimental to future manufacture. On the contrary, all designs for that day are being prepared in order to use most specifically those materials which will be available in the greatest quantities. In the 1920's, designers worked at fever heat to satisfy the screaming demand for more and more buildings, products and vehicles. Unfortunately, they were not fortified against this unusual activity with plans that had been meticulously developed in slack periods. The same mistakes will be made again unless we set ourselves to profit by what has been learned over the intervening years.

Today, however, the designer is operating with a "split personality" in a dual role. He is co-ordinating the various fields of his endeavor so that each type of design may benefit. He is working to produce in a state of unlimited emergency, but at the same time he is preparing a 10-year schedule for good design when all materials are plentiful. Above all, by predetermining trends in public taste and by setting his aesthetic taste at its highest level, he will produce the most beautiful accessories to living ever available to any civilization.

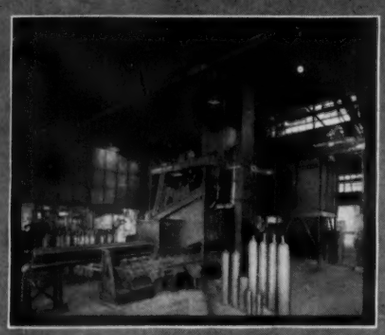
Trends Affect Design

Several definite trends in American manufacture directly affect the nature of design in the years to come. Of these the most significant is the tendency to reduce the number of models in any given line of products. Production will be condensed to concentrate every facility for selling on a single perfect unit. The extravagance of American design has been the result of adding to a simple entity the "deluxe" features to which the American public has become accustomed.

Another trend which is affecting design through business is the increasing threat to the large manufacturing corporations of government operation. In order to protect itself, private industry must demonstrate clearly to the masses that no other system could possibly do a better job. Distinctive design at minimum cost, reflecting imagination and taste, is the best single advantage that private industry has over government-manufactured products. By designing now for days of peace, the designer is preparing with industry for the immediate economical conversion of plant activities into peacetime efforts, and for the preservation of private enterprise.

Considering the public funds that are being poured into industries for manufacture in time of war, private industry can and should be better equipped than ever before to operate independently. With the variety of products reduced and the facilities for manufacture increased, the designer is called upon to double his administrative and creative efforts and is proceeding with customary exuberance to plan for the production program of the next 10 years.

"WHAT A CHANGE ONE GENERATION MAKES!"



1923 1941

BLAST CLEANING PRODUCTION INCREASES 200 PER CENT

Just one generation ago the Management of a Pennsylvania company manufacturing steel oxygen cylinders was very proud of the above semi-automatic blast cleaning installation. It cleaned their entire production of various sized work in a new record time for the industry.

Today—National Defense has again demanded greatly increased production of oxygen cylinders.

The Army, Navy and Air Force, require great supplies of oxygen. All planes that fly at high altitudes provide oxygen through breathing masks to crew members in order to sustain life in the stratosphere.

So the call was issued for *three times* the former production of cylinders.

But blast cleaning was the bottleneck to the increased schedule. Again Management came to Pangborn with their problem—and in "jig-time" our engineers had designed, and our shops have built, the sturdy ROTOBLAST installation pictured above. This equipment handles *three times* the production of the old installation — *cheaper* — *better* and *automatically!*

If you have a blast cleaning problem—come to Pangborn today. No obligation, of course.

WORLD'S LARGEST MANUFACTURER OF BLAST CLEANING & DUST CONTROL EQUIPMENT

PANGBORN

PANGBORN CORPORATION · · · HAGERSTOWN, MD.

Production Records At New High Levels

Pig iron and iron ore exceed previous figures. Scrap shortage more threatening. Steel operations again approach capacity

MARKET IN TABLOID ★

Demand

Mills turn back much inquiry.

Prices

No change in ceilings.

Production

Rose 2 points to 97½ per cent.

■ WITH steel production consistently but a few points below theoretical capacity only necessity for periodical open-hearth furnace repair and inability to obtain sufficient scrap stand in the way of output above 100 per cent of rated capacity.

New records are being set in iron ore and pig iron, thus providing a broad basis for steel production if the scrap situation can be bettered. The latter is the major factor and looms ominously as a threat to production during the next few months. Steelmaking furnaces recently shut down because of scrap shortage remain idle and others are expected to go out shortly. Government agencies are attempting nationwide organization to bring out all available supplies, particularly from homes and farms. Meanwhile, some relief is given by added pig iron tonnage from new or rehabilitated blast furnace stacks. As a whole the steel industry has little more than enough scrap for about 30 days production and receipts are far short of consumption.

While the labor situation contains implications of further interruption it is possible better counsels may prevail and strikes be avoided. At the moment the situation is quiet.

October ingot production totaled 7,242,683 net tons, a new monthly record, topping that of March, when 7,131,641 tons were made. Production in ten months was 68,793,571 tons, which is larger than any full year in the history of the steel industry.

October pig iron production set two all-time records, the highest month on record and the highest total for the first ten months of any year. Output was 4,855,746 net tons, 2.8 per cent above 4,721,337 tons in September, and 9.4 per cent over 4,437,725 tons in October, 1940. Ten months output aggregated 46,191,610 tons, 21.7 per cent greater than for the comparable months in 1940. Daily rate of output was 156,637 tons, 0.47 per cent less than in September, being second highest daily rate in history. Daily average for ten months was by far the highest ever attained for a similar period.

Lake Superior iron ore shipments to Nov. 1 set a new record, a total of 71,224,580 gross tons being moved, which compares with the record full season total of 65,204,600 tons in 1929. Effect of interruption in the Sault Ste. Marie locks by a damaged bridge is seen in a decline of 465,063 tons in October. The month's total was 9,596,064 tons, compared with 10,061,127 tons in October, 1940.

Wiremakers are suffering from lack of raw material, diversion of steel to other products limiting production of wire rods. Demand for wire products is heavy, much of it with high priority, but deliveries are slow, especially on material requiring much processing. Nails are increasingly scarce and stocks are at a low point.

Tin plate makers are running at capacity through the usually slack period following closing of the vegetable canning season. Some consumers whose needs were held back in favor of canners are now being supplied more fully and the large allocation for British colonies adds to backlogs. Little allocation has been necessary in this product but this condition is expected to change when supply of steel raw material is shortened in favor of other products.

Considerable interest attaches to recent arrival of 2500 tons of ferromanganese from England, second installment of a 5000-ton order. Cutting off of markets on the Continent is believed to have made it possible for England to ship the material here. This is the first arrival of ferro from abroad in a number of years.

Automobile production continues steady, output last week being 93,585 units, an increase of 706 over the 92,879 made in the previous week. This compares with 120,948 cars made in the corresponding week last year. The smaller current figure results from the reduced production allowed under government regulation.

Operations last week advanced 2 points to 97½ per cent of capacity, on a gain of 9 points at Pittsburgh, rebound from the effects of a strike the preceding week, modified by several small declines at other points. Pittsburgh reacted to 99 per cent; Detroit gained 4 points to 95 and St. Louis 15 points to 98 per cent. Chicago lost 2½ points to 101 per cent; Cincinnati, 4 points to 87½; Eastern Pennsylvania 1 point to 91; Cleveland 3 points to 94; Buffalo 2 points to 79; Youngstown 1 point to 97. Rates were unchanged at Birmingham, 95 per cent; Wheeling, 95; New England 90.

Composites are unchanged: Finished steel, $56.73; semifinished steel, $36.00; steelmaking pig iron, $23.05; steelmaking scrap, $19.17.

COMPOSITE MARKET AVERAGES

	Nov. 8	Nov. 1	Oct. 25	One Month Ago Oct., 1941	Three Months Ago Aug., 1941	One Year Ago Nov., 1940	Five Years Ago Nov., 1936
Finished Steel	$56.73	$56.73	$56.73	$56.73	$56.73	$56.73	$53.36
Semifinished Steel	36.00	36.00	36.00	36.00	36.00	36.00	34.40
Steelmaking Pig Iron	23.05	23.05	23.05	23.05	23.05	22.05	18.63
Steelmaking Scrap	19.17	19.17	19.17	19.17	19.17	20.80	16.50

Finished Steel Composite:—Average of industry-wide prices on sheets, strip, bars, plates, shapes, wire, nails, tin plate, standard and line pipe. Semifinished Steel Composite:—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. Steelmaking Pig Iron Composite:—Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City and Youngstown. Steelworks Scrap Composite:—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Nov. 8, 1941	Oct. 1941	Aug. 1941	Nov. 1940
Steel bars, Pittsburgh	2.15c	2.15c	2.15c	2.15c
Steel bars, Chicago	2.15	2.15	2.15	2.15
Steel bars, Philadelphia	2.47	2.47	2.47	2.47
Shapes, Pittsburgh	2.10	2.10	2.10	2.10
Shapes, Philadelphia	2.215	2.215	2.215	2.215
Shapes, Chicago	2.10	2.10	2.10	2.10
Plates, Pittsburgh	2.10	2.10	2.10	2.10
Plates, Philadelphia	2.15	2.15	2.15	2.15
Plates, Chicago	2.10	2.10	2.10	2.10
Sheets, hot-rolled, Pittsburgh	2.10	2.10	2.10	2.10
Sheets, cold-rolled, Pittsburgh	3.05	3.05	3.05	3.05
Sheets, No. 24 galv., Pittsburgh	3.50	3.50	3.50	3.50
Sheets, hot-rolled, Gary	2.10	2.10	2.10	2.10
Sheets, cold-rolled, Gary	3.05	3.05	3.05	3.05
Sheets, No. 24 galv. Gary	3.50	3.50	3.50	3.50
Bright bess., basic wire, Pitts.	2.60	2.60	2.60	2.60
Tin plate, per base box, Pitts.	$5.00	$5.00	$5.00	$5.00
Wire nails, Pittsburgh	2.55	2.55	2.55	2.55

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$34.00	$34.00	$34.00	$34.00
Slabs, Pittsburgh, Chicago	34.00	34.00	34.00	34.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	34.00
Wire rods No. 5 to 9/32-inch, Pitts.	2.00	2.00	2.00	2.00

Pig Iron

	Nov. 8, 1941	Oct. 1941	Aug. 1941	Nov. 1940
Bessemer, del. Pittsburgh	$25.34	$25.34	$25.34	$24.34
Basic, Valley	23.50	23.50	23.50	22.50
Basic, eastern, del. Philadelphia	25.34	25.34	25.34	24.34
No. 2 fdry., del. Pgh., N.&S. Sides	24.69	24.69	24.69	23.69
No. 2 foundry, Chicago	24.00	24.00	24.00	23.00
Southern No. 2, Birmingham	20.38	20.38	20.38	19.38
Southern No. 2, del. Cincinnati	24.06	24.06	24.06	23.06
No. 2X, del. Phila. (differ. av.)	26.215	26.215	26.215	25.215
Malleable, Valley	24.00	24.00	24.00	23.00
Malleable, Chicago	24.00	24.00	24.00	23.00
Lake Sup., charcoal, del. Chicago	31.34	31.34	31.34	30.34
Gray forge, del. Pittsburgh	24.19	24.19	24.19	23.17
Ferromanganese, del. Pittsburgh	125.33	125.33	125.33	125.33

Scrap

Heavy melting steel, Pitts.	$20.00	$20.00	$20.00	$21.50
Heavy melt. steel, No. 2, E. Pa.	17.75	17.75	17.75	19.75
Heavy melting steel, Chicago	18.75	18.75	18.75	20.25
Rails for rolling, Chicago	22.25	22.25	22.25	24.55
No. 1 Cast, Chicago	20.00	18.75	18.75	18.25

Coke

Connellsville, furnace, ovens	$6.25	$6.25	$6.25	$4.75
Connellsville, foundry, ovens	7.25	7.25	7.25	5.75
Chicago, by-product fdry., del.	12.25	12.25	12.25	11.75

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. mill, carloads.

Sheets, Strip

Hot-Rolled Sheets

Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base 2.10c
Granite City base 2.20c
Detroit, del. 2.20c
Pacific ports 2.65c

Cold-Rolled Sheets

Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, B'ham., base 3.05c
Granite City, base 3.15c
Detroit, del. 3.15c
Other Mich. pts., del. 2.25c
Pacific ports 3.70c

Galvanized Sheets, No. 24

Pittsburgh, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base 3.50c
Granite City, base 3.60c
Pacific ports 4.05c

Corrugated Galv. Sheets

Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, 29 gage, per square 3.31c
Granite City 3.38c
Pacific Ports 3.73c

Culvert Sheets

Pittsburgh, Gary, Birmingham, 16-gage, not corrugated, copper steel 3.60c, copper iron 3.90c, pure iron 3.95c.

Pittsburgh, 24-gage, zinc-coated, hot-dipped, heat-treated 4.25c.

Granite City, copper steel 3.70c, copper iron 4.00c, pure iron 4.05c.

Pacific ports, copper steel 4.25c, copper iron 4.55c, pure iron 4.60c.

Enameling Sheets

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, 10 gage, base 2.75c
Granite City, base 2.85c
Pacific ports 3.40c
Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, 20 gage, base 3.35c
Granite City, base 3.45c
Pacific ports 4.00c

Electrical Sheets, No. 24

	Pittsburgh Base	Pacific Ports	Granite City
Field gr.	3.20c	3.95c	3.30c
Armat.	3.55c	4.30c	3.65c
Elect.	4.05c	4.80c	4.15c

Motor	4.95c	5.70c	5.05c
Dynamo	5.65c	6.40c	5.75c
Transformer			
72	6.15c	6.90c	.....
65	7.15c	7.90c	.....
58	7.65c	8.40c	.....
52	8.45c	9.20c	.....

Hot-Rolled Strip

Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Middletown, base, 1 ton and over, 12 inches wide and less 2.10c
Detroit, del. 2.20c
Other Mich. pts. del. 2.25c
Pacific ports 2.75c

Cold-Rolled Strip

Pittsburgh, Cleveland, Youngstown, 0.25 carbon and less 2.80c
Chicago, base 2.90c
Worcester, base 3.00c
Detroit, del. 2.90c
Other Mich. pts. del. 2.95c

Commodity C.R. Strip

Pittsburgh, Cleveland, Youngstown, base 3 tons and over 2.95c
Worcester, base 3.35c
Detroit, del. 3.05c
Other Mich. pts. del. 3.10c

Cold-Finished Spring Steel

Pittsburgh, Cleveland, base; add 20 cents for Worcester.
.26-.50 Carbon 2.80c
.51-.75 Carbon 4.30c
.76-1.00 Carbon 6.15c
Over 1.00 Carbon 8.35c

Stainless Steels

Base, Cents per lb.—f.o.b. Pittsburgh

TYPE	BARS	PLATES	SHEETS	H. R. STRIP	C. R. STRIP
302	24.00c	27.00c	34.00c	21.50c	28.00c
303	26.00	29.00	36.00	27.00	33.00
304	25.00	29.00	36.00	23.50	30.00
304-20% clad	.....	*18.00	19.00	.....	.....
308	29.00	34.00	41.00	28.50	35.00
309	36.00	40.00	47.00	37.00	47.00
310	49.00	52.00	53.00	48.75	56.00
311	49.00	52.00	53.00	48.75	56.00
312	36.00	40.00	49.00	.....	.....
316	40.00	44.00	48.00	40.00	48.00
317	50.00	54.00	58.00	50.00	58.00
347	33.00	38.00	45.00	33.00	42.00
403	21.50	24.50	29.50	21.25	27.00
410	18.50	21.50	26.50	17.00	22.00
416	19.00	22.00	27.00	18.25	23.50
420	24.00	28.50	33.50	23.75	36.50
430	19.00	22.00	29.00	17.50	22.50
430F	19.50	22.50	29.50	18.75	24.50
431	19.00	22.00	29.00	17.50	22.50
442	22.50	25.50	32.50	24.00	32.00
446	27.50	30.50	36.50	35.00	52.00
501	8.00	12.00	15.75	12.00	17.00
502	9.00	13.00	16.75	13.00	18.00

*Includes annealing and pickling.

Tin, Terne Plate

Tin Plate

Pittsburgh, Chicago, Gary, 100-lb. base box 5.00
Granite City 5.10

Tin Mill Black Plate

Pittsburgh, Chicago, Gary, base 29 gage and lighter 3.05c
Granite City 3.15c
Pacific ports, boxed 4.05c

Long Ternes

Pittsburgh, Gary No. 24 unassorted 3.80c
Pacific Ports 4.55c

Special Coated Mfg. Ternes

Pittsburgh, Chicago, Gary, 100-base box 4.30
Granite City 4.40

Roofing Ternes

Pittsburgh base per package 112 sheets 20 x 28 in., coating I.C.

8-lb.	$12.00	25-lb.	$16.00
15-lb.	14.00	30-lb.	17.25
20-lb.	15.00	40-lb.	19.50

Steel Plate

Pittsburgh, Chicago, Gary, Cleveland, Birmingham,

Youngstown 2.10c
Coatesville, Sparrows Point, Claymont 2.10c
Gulf ports 2.45c
Pacific Coast ports 2.65c

Steel Floor Plates

Pittsburgh 3.35c
Chicago 3.35c
Gulf ports 3.70c
Pacific Coast ports 4.00c

Structural Shapes

Pittsburgh, Bethlehem, Chicago, Buffalo, Birmingham 2.10c
St. Louis, del. 2.34c
Pacific Coast ports 2.75c

Bars

Hot-Rolled Carbon Bars

Pittsburgh, Chicago, Gary, Cleve., Birm., base 20 tons one size 2.15c
Detroit, del. 2.25c
New York, del. 2.49c
Duluth, base 2.25c
Philadelphia, del. 2.47c
Gulf ports, dock 2.50c
All-rail, Houston from Birmingham 2.59c
Pac. ports, dock 2.80c
All-rail from Chicago.. 3.25c

Rail Steel Bars

Pitts., Chicago, Gary, Cleveland, Birm., base 5 tons 2.15c
Detroit, del. 2.25c
New York, del. 2.49c
Philadelphia, del. 2.47c
Gulf ports, dock 2.50c
All-rail, Houston from Birmingham 2.59c
Pac. ports, dock 2.80c
All-rail from Chicago.. 3.25c

Hot-Rolled Alloy Bars

Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size 2.70c
Detroit 2.80c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.70	3300	3.80
2500	2.55	3400	3.20

4100 .15-25 Mo. 0.55
4600 0.20-0.30 Mo.; 1.50-2.00 Ni. 1.20
5100 80-1.10 Cr. 0.45
5100 Spr. flats 0.15
6100 Bars 1.20
6100 Spr. flats 0.85
Carb., Van. 0.85
9200 Spr. flats 0.15
9200 Spr. rounds, squares 0.40
T 1300, Mn, mean 1.51-2.00 0.10
Do., carbon under 0.20 max. 0.35

Cold-Finished Carbon Bars

Pitts., Chicago, Gary, Cleveland, Buffalo, base 20,000-39,999 lbs. 2.65c
Detroit 2.70c

Cold-Finished Alloy Bars

Pitts., Chicago, Gary, Cleveland, Buffalo, base 3.35c
Detroit 3.45c
Galveston, add $0.25; Pacific Coast, $0.50.

Turned, Ground Shafting

Pitts., Chicago, Gary, Cleveland, Buffalo, base (not including turning, grinding, polishing extras) 2.65c
Detroit 2.70c

Reinforcing Bars (*New Billet*)

Pitts., Chicago, Gary, Cleveland, Birm., Sparrows Point, Buffalo, Youngstown, base 2.15c
Gulf ports, dock 2.50c
All-rail, Houston from Birmingham 2.59c
Pacific ports, dock 2.80c
Detroit, del. 2.25c

Reinforcing Bars (*Rail Steel*)

Pitts., Chicago, Gary, Cleveland, Birm., base. 2.15c
Gulf ports, dock 2.50c
All-rail, Houston from Birmingham 2.59c
Pacific ports, dock 2.80c
Detroit, del. 2.25c

Iron Bars

Philadelphia, com. del. 3.06-3.50c
Pittsburgh, muck bar ... 5.00c
Pittsburgh, staybolt 8.00c
Terre Haute com., f.o.b. mill 2.15c

Wire Products

Pitts.-Cleve.-Chicago-Birm. base per 100 lb. keg in carloads

Standard and cement coated wire nails $2.55

(Per Pound)

Polished fence staples .. 2.55c
Annealed fence wire 3.05c
Galv. fence wire 3.40c
Woven wire fencing (base C. L. column) 67
Single loop bale ties, (base C. L. column) .. 59
Galv. barbed wire, 80-rod spools, base column .. 70
Twisted barbless wire, column 70

To Manufacturing Trade

Base, Pitts. - Cleve. - Chicago Birmingham (except spring wire at Birmingham)

Bright bess., basic wire. 2.60c
Galvanized wire 2.60c
Spring wire 3.20c
Worcester, Mass., 10c higher on bright basic and spring wire.

Cut Nails

Carload, Pittsburgh, keg. $3.85

Alloy Plates (Hot)

Pitts., Chicago, Coatesville, Pa. 3.50c

Rails, Fastenings

(Gross Tons)

Standard rails, mill $40.00
Relay rails, Pittsburgh 20—100 lbs. 32.50-35.50
Light rails, billet qual., Pitts., Chicago, Bham. $40.00
Do., rerolling quality.. 39.00

Cents per pound

Angle bars, billet, mills. 2.70c
Do., axle steel 2.35c
Spikes, R. R. base 3.00c
Track bolts, base 4.75c
Do., heat treated 5.00c
Car axles forged, Pitts., Chicago, Birmingham.. 3.15c
Tie plates, base 2.15c
Base, light rails 25 to 60 lbs., 20 lbs., up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

F.o.b. Pittsburgh, Cleveland, Birmingham, Chicago. Discounts for carloads additional 5%, full containers, add 10%.

Carriage and Machine

½ x 6 and smaller.....65½ off
Do., ⅞ and ¾ x 6-in. and shorter .....63½ off
Do., ¾ to 1 x 6-in. and shorter .....61 off
1⅛ and larger, all lengths 59 off
All diameters, over 6-in. long .....59 off
Tire bolts .....50 off

Stove Bolts

In packages with nuts separate 71-10 off; with nuts attached 71 off; bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.

Step bolts .....56 off
Plow bolts .....65 off

Nuts

Semifinished hex.	U.S.S.	S.A.E.
½-inch and less.	62	64
⅝-1-inch	59	60
1⅛-1½-inch	57	58
1⅝ and larger..	56	

Hexagon Cap Screws

Upset 1-in., smaller .....60 off

Square Head Set Screws

Upset, 1-in., smaller ....68 off
Headless, ¼-in., larger ..55 off
No. 10, smaller .....60 off

Piling

Pitts., Chgo., Buffalo .. 2.40c

Rivets, Washers

F.o.b. Pitts., Cleve., Chgo., Bham.

Structural 3.75c
⅞-inch and under .....65-5 off
Wrought washers, Pitts., Chi., Phila., to jobbers and large nut, bolt mfrs. l.c.l .....$3.50 off

Tool Steels

Pittsburgh, Bethlehem, Syracuse, base, cents per lb.

Carb. Reg. 14.00 Oil-hardening .. 24.00
Carb. Ext. 18.00
Carb. Spec. 22.00 High car.-chr. 43.00

High Speed Tool Steels

Tung.	Chr.	Van.	Moly.	
18.00	4	1	...	67.00
18.00	4	2	1	77.00
18.00	4	3	1	87.00
1.50	4	1	8.50	54.00
....	4	2	8	54.00
5.50	4	1.50	4	57.50
5.50	4.50	4	4.50	70.00

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut-lengths 4 to 24 feet; f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Welded

Sizes	Gage	Steel	Charcoal Iron
1½" O.D.	13	$ 9.72	$23.71
1¾" O.D.	13	11.06	22.93
2" O.D.	13	12.38	19.35
2¼" O.D.	13	13.79	21.68
2¼" O.D.	12	15.16	....
2½" O.D.	12	16.58	26.57
2¾" O.D.	12	17.54	29.00
3" O.D.	12	18.35	31.36
3½" O.D.	11	23.15	39.81
4" O.D.	10	28.66	49.90
5" O.D.	9	44.25	73.93
6" O.D.	7	68.14	....

Seamless

Sizes	Gage	Hot Rolled	Cold Drawn
1" O.D.	13	$ 7.82	$ 9.01
1¼" O.D.	13	9.26	10.67
1½" O.D.	13	10.23	11.79
1¾" O.D.	13	11.64	13.42
2" O.D.	13	13.04	15.03
2¼" O.D.	13	14.54	16.76
2¼" O.D.	12	16.01	18.45
2½" O.D.	12	17.54	20.21
2¾" O.D.	12	18.59	21.42
3" O.D.	12	19.50	22.48
3½" O.D.	11	24.62	28.37
4" O.D.	10	30.54	35.20
4½" O.D.	10	37.35	43.04
5" O.D.	9	46.87	54.01
6" O.D.	7	71.96	82.93

Welded Iron, Steel, Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2½ and 1½ less, respectively. Wrought pipe, Pittsburgh base.

Butt Weld

Steel

In.	Blk.	Galv.
⅛	63½	51
¼	66½	55
⅜—3	68½	57½

Iron

¼	30	10
⅜—1¼	34	16
1½	38	18½
2	37½	18

Lap Weld

Steel

2	61	49½
2½—3	64	52½
3½—6	66	54½
7 and 8	65	52½

Iron

2	30½	12
2½—3½	31½	14½
4	33½	18
4½—8	32½	17
9—12	28½	12

Line Pipe, Plain Ends

Steel

1 to 3, butt weld..... 68½
2, lap weld 63
2½ to 3, lap weld 66
3½ to 6, lap weld 65
7 and 8, lap weld 64
Seamless, 3 pts. lower discount.

Cast Iron Pipe

Class B Pipe—Per Net Ton

6-in., & over, Birm..$45.00-46.00
4-in., Birmingham .. 48.00-49.00
4-in., Chicago 56.80-57.80
6-in. & over, Chicago 53.80-54.80
6-in. & over, east fdy. 49.00
Do., 4-in 52.00
Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00.

Semifinished Steel

Rerolling Billets, Slabs

(Gross Tons)

Pittsburgh, Chicago, Gary, Cleve., Buffalo, Youngs., Birm., Sparrows Point..$34.00
Duluth (billets) 36.00
Detroit, delivered 36.00

Forging Quality Billets

Pitts., Chi., Gary, Cleve., Young., Buffalo, Birm.. 40.00
Duluth 42.00

Sheet Bars

Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago. 34.00
Detroit, delivered 36.00

Wire Rods

Pitts., Cleveland, Chicago, Birmingham No. 5 to ⅜-inch incl. (per 100 lbs.) $2.00
Do., over ⅜ to 11/32-in. incl. 2.15
Worcester up $0.10, Galveston up $0.25 and Pacific Coast up $0.50 on water shipments.

Skelp

Pitts., Chi., Youngstown, Coatesville, Sparrows Pt. 1.90c

Shell Steel

Pittsburgh, Chicago, base, 1000 tons of one size, open hearth

3-12-inch $52.00
12-18-inch 54.00
18-inch and over 56.00

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur... $6.00- 6.25
Connellsville, fdry.. 7.00- 7.50
Connell. prem. fdry. 7.25- 7.60
New River fdry. .. 8.00- 8.25
Wise county fdry. .. 7.50
Wise county fur. .. 6.50

By-Product Foundry

Newark, N. J., del... 12.60-13.05
Chicago, outside del. 11.50
Chicago, delivered .. 12.25
Terre Haute, del. .. 12.00
Milwaukee, ovens... 12.25
New England, del. .. 13.75
St. Louis, del. 12.02
Birmingham, ovens. 8.50
Indianapolis, del. .. 12.00
Cincinnati, del. 11.75
Cleveland, del. 12.30
Buffalo, del. 12.50
Detroit, del. 12.25
Philadelphia, del. .. 12.38

Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol.... 14.00c
Toluol, two degree 27.00c
Solvent naphtha 26.00c
Industrial xylol 26.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (less than 1000 lbs.) 14.75
Do. (1000 lbs. or over) 13.00

Eastern Plants, per lb.

Naphthalene flakes, balls, bbls. to jobbers 7.00c

Per ton, bulk, f.o.b. port

Sulphate of ammonia $30.00

Pig Iron

No. 2 foundry is 1.75-2.25 sil.; 50c diff. for each 0.25 sil. above 2.25 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$25.00	$25.50	$24.50	$26.00
Birmingham, Ala.§	20.38	.....	19.38	25.00
Birdsboro, Pa.	25.00	25.50	24.50	26.00
Buffalo	24.00	24.50	23.00	25.00
Chicago	24.00	24.00	23.50	24.50
Cleveland	24.00	24.00	23.50	24.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50	.....	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.00	25.50	24.50	26.00
Granite City, Ill.	24.00	24.00	23.50	24.50
Hamilton, O.	24.00	24.00	23.50	.....
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	22.00	.....	.....	.....
Sharpsville, Pa.	24.00–24.50	24.00–24.50	23.50–24.50	24.50–25.00
Sparrow's Point, Md.	25.00	.....	24.50	.....
Swedeland, Pa.	25.00	25.50	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00–24.50	24.00–24.50	23.50–24.50	24.50–25.00

§Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	25.39	25.39	24.89	25.89
Baltimore from Birmingham†	25.61	.....	25.11	.....
Boston from Birmingham†	25.12	.....	.....	.....
Boston from Everett, Mass.	25.50	26.00	25.00	26.50
Boston from Buffalo	25.50	26.00	25.00	26.50
Brooklyn, N. Y., from Bethlehem	27.50	28.00	.....	.....
Canton, O. from Cleveland	25.39	25.39	24.89	25.89
Chicago from Birmingham	†24.22	.....	.....	.....
Cincinnati from Hamilton, O.	24.44	25.11	24.61	.....
Cincinnati from Birmingham†	24.06	.....	23.06	.....
Cleveland from Birmingham†	24.12	.....	23.12	.....
Mansfield, O., from Toledo, O.	25.94	25.94	25.44	.....
Milwaukee from Chicago	25.10	25.10	24.60	25.60
Muskegon, Mich., from Chicago, Toledo or Detroit	27.19	27.19	.....	.....
Newark, N. J., from Birmingham†	26.15	.....	.....	.....
Newark, N. J., from Bethlehem	26.53	27.03	.....	.....
Philadelphia from Birmingham†	25.46	.....	24.96	.....
Philadelphia from Swedeland, Pa.	25.84	26.34	25.34	.....

Pittsburgh dist.: Add to Neville Island base, North and South Sides, 69c; McKees Rocks, 55c; Lawrenceville, Homestead, McKeesport, Ambridge, Monaca, Aliquippa, 84c; Monessen, Monongahela City, $1.07; Oakmont, Verona, $1.11; Brackenridge, $1.24.

	No. 2 Fdry.	Malleable	Basic	Bessemer
Saginaw, Mich., from Detroit	26.31	26.31	25.81	26.81
St. Louis, northern	24.50	24.50	24.00	.....
St. Louis from Birmingham	†24.50	.....	23.62	.....
St. Paul from Duluth	26.63	26.63	.....	27.13

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Buffalo, N. Y., $29.50, base; $30.74 delivered Philadelphia.

Gray Forge		Charcoal	
Valley furnace	$23.50	Lake Superior fur.	$28.00
Pitts. dist. fur.	23.50	do., del. Chicago	31.34
		Lyles, Tenn., high phos.	28.50

Silvery

Jackson county, O., base, 6.00 to 6.50 per cent $29.50. Add 50 cents for each additional 0.25 per cent of silicon. Buffalo base $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base; Prices are the same as for silveries, plus $1 a ton.

Manganese differentials in silvery iron and ferrosilicon not to exceed 50 cents per 0.50 per cent manganese in excess of 1 per cent.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$64.60

First Quality

Pa., Ill., Md., Mo., Ky.	51.30
Alabama, Georgia	51.30
New Jersey	56.00

Second Quality

Pa., Ill., Ky., Md., Mo.	46.35
Georgia, Alabama	38.00
New Jersey	49.00

Ohio

First quality	43.00
Intermediate	36.10
Second quality	36.00

Malleable Bung Brick

All bases	$59.85

Silica Brick

Pennsylvania	$51.30
Joliet, E. Chicago	58.90
Birmingham, Ala.	51.30

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$31.00
Wire cut	29.00

Magnesite

Domestic dead-burned grains, net ton f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$54.00
Chem. bonded chrome	54.00
Magnesite brick	76.00
Chem. bonded magnesite	65.00

Fluorspar

Washed gravel, duty pd., tide. net ton	nominal
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	$23.00
Do., barge	23.00
No. 2 lump	23.00

Ferroalloy Prices

Ferromanganese, 78-82%, Carlots, duty pd., seab'd $120.00; Carlots, del. Pittsburgh 125.33; Carlots, f.o.b. So. f'ces. 145.00. Add $10 for ton, $13.50 for less ton, $18 for less than 200-lb. lots.

Spiegeleisen, 19-21%, gross ton, Palmerton 336.00

Manganese Briquets, Contract carloads, bulk freight allowed, per lb. 5.50c; Packed 5.75c; Ton lots 6.00c; Less-ton lots 6.25c; Less 200-lb. lots 6.50c. Spot ¼c higher.

Manganese Electro, 99.9+%, less car lots 42.00c

Chromium Metal, per lb. contained chromium

	Contract	Spot
98% Cr. ton lots	80.00c	85.00c
88% Cr. ton lots	79.00c	84.00c

Ferrocolumbium, 50-60% f.o.b. Niagara Falls, per lb. contained Cb on contract 82.25; Less-ton lots 2.30 (Spot 10c higher)

Chromium Briquets, per lb., freight allowed

	Contract	Spot
Carlots	8.25c	8.50c
Packed	8.50c	8.75c
Ton lots	8.75c	9.00c
Less-ton lots	9.00c	9.25c
Less 200 lbs.	9.25c	9.50c

Ferrochrome, 66-70%, freight allowed, 4-6% carbon, per pound contained (chrome)

Carloads	13.00c
Ton lots	13.75c
Less-ton lots	14.00c
Less than 200-lb. lots	14.25c

67-72%, low carbon, cts. per pound:

	Car loads	Ton lots	Less ton	Less 200 lbs.
2% C.	19.50	20.25	20.75	21.00
1% C.	20.50	21.25	21.75	22.00
0.20% C.	21.50	22.25	22.75	23.00
0.10% C.	22.50	23.25	23.75	24.00

Spot is ¼c higher.

Ferromolybdenum, 55-75%, per lb. contained molybdenum, f.o.b. furnace 95.00c

Calcium Molybdate (Molyte), 40-45% Mo., per lb. contracts, f.o.b. producers plant 80.00c

Molybdic Oxide Briquets, 48-52% Mo. per lb. contained, f.o.b. producers plant 30.00c

Molybdenum Oxide, (In 5 and 20 lb. mo. contained cans) 53-63 mo. per lb. contained f.o.b. producers' plants 30.00c

Molybdenum Powder, 99%, f.o.b. York, Pa., per lb. in 200-lb. kegs 82.60; Do., 100-200 lb. lots 2.75; Do., under 100-lb. lots 3.00

Ferrophosphorus, 17-19%, gross ton carloads, f.o.b. sellers' works, $3 unitage, freight equalized with Rockdale, Tenn. for 18% phos.

Contract	$58.50
Spot	62.25

23-26%, $3 unitage, freight equalized with Mt. Pleasant, Tenn., for 24% phos.

Contract	75.00
Spot	80.00

Ferrosilicon, Gross tons, freight allowed, bulk

	Carloads	Ton lots
50%	$ 74.50	$ 87.00
Unitage	1.50	1.75
75%	135.00	151.00
Unitage	1.80	2.00
85%	170.00	188.00
Unitage	2.00	2.20
90-95%	10.25c	11.25c

(Above for contracts; spot ¼c higher)

Silicon Metal, Spot ¼-cent higher (Per Lb., Contracts):

	1% Iron	2% Iron
Carlots	14.50c	13.00c
Ton lots	15.00c	13.50c
Less-ton lots	15.25c	13.75c
Less 200 lbs.	15.50c	14.00c

Silicon Briquets, Contract carloads, bulk freight allowed, per ton 74.50; Packed 80.50; Ton lots 84.50; Less-ton lots, per lb. 4.00c; Less 200-lb. lots 4.25c. Spot ¼c higher on less ton lots; $5 higher on ton lots and over.

Silicomanganese,

Carbon	1½%	2½%
Carloads (contract)	$128.00	$118.00
Ton Lots (contract)	140.50	130.50

Freight allowed spot 35 above contract

Ferrotungsten, (All prices nominal) Carlots, per lb. contained tungsten 1.90

Tungsten Metal Powder, (Prices Nominal) 98-99 per cent, per pound, depending upon quantity 2.60-2.65

Ferrotitanium, 40-45%, f.o.b. Niagara Falls, per lb. contained in ton lots 1.23

Less ton lots 1.25

20-25%, C. 0.10 max., in ton lots per lb. contained Ti 1.35; Less-ton lots 1.40 (Spot 5c higher)

Ferro-Carbon-Titanium, 15-20% Titanium,

	6-8% C	3-5% C
Carlots, contract, f.o.b. Niagara Falls, freight allowed to destinations east of Mississippi and north of Baltimore and St. Louis	$142.50	$157.50

Ferrovanadium, 35-40%, contract per pound contained vanadium 2.70-2.80-2.90 (Spot 10c higher)

Vanadium Pentoxide, Per lb. contained, contracts 1.10; Do., spot 1.15

Zirconium Alloy, 12-15%, carloads, contract, bulk 102.50; Packed 107.50; Ton lots 108.00; Less ton lots 112.50. Spot $5 a ton higher

35-40%, contract, carloads, bulk or package, per lb. alloy 14.00c; Do., ton lots 15.00c; Do., less-ton lots 16.00c. Spot is ¼-cent higher

Alsifer, Per lb., f.o.b. Niagara Falls.

	Contract	Spot
Carlots	7.50c	8.00c
Ton lots	8.00c	8.50c

Simanal, Per lb. of alloy, contracts, freight allowed (approx. 20% Si, 20% Mn, 20% Al)

Carlots	Ton Lots	Ton Lots
10.50c	11.00c	11.50c

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets: Hot Rolled	Sheets: Cold Rolled	Sheets: Galv. No. 24	Cold Rolled Strip	Cold Drawn Bars: Carbon	Cold Drawn Bars: S.A.E. 2300	Cold Drawn Bars: S.A.E. 3100
Boston	3.98	4.06	5.06	3.85	3.85	5.66	3.71	4.48	5.11	3.46	4.13	8.88	7.23
New York (Met.)	3.84	3.96	3.96	3.76	3.75	5.56	3.58	4.60	5.00	3.51	4.09	8.84	7.19
Philadelphia	3.85	3.95	4.45	3.55	3.55	5.25	3.55	4.05	5.26	3.31	4.06	8.56	7.10
Baltimore	3.85	4.00	4.35	3.70	3.70	5.25	3.50	....	5.05	....	4.05	....	....
Norfolk, Va.	4.00	4.10	....	4.05	4.05	5.45	3.85	....	5.40	....	4.15	....	....
Buffalo	3.35	3.82	3.82	3.62	3.40	5.25	3.25	4.30	4.75	3.52	3.75	8.40	6.75
Pittsburgh	3.35	3.60	3.60	3.40	3.40	5.00	3.35	....	4.65	....	3.65	8.40	6.75
Cleveland	3.25	3.50	3.50	3.40	3.58	5.18	3.35	4.05	4.62	3.20	3.75	8.40	6.75
Detroit	3.43	3.43	3.68	3.60	3.65	5.27	3.43	4.30	4.84	3.40	3.80	8.70	7.05
Indianapolis	3.60	3.75	3.75	3.70	3.70	5.30	3.45	....	5.01	....	3.97	....	....
Cincinnati	3.60	3.67	3.67	3.65	3.68	5.28	3.42	4.00	4.92	3.47	4.00	8.75	7.10
Chicago	3.50	3.60	3.60	3.55	3.55	5.15	3.25	4.10	4.85	3.30	3.75	8.40	6.75
Twin Cities	3.75	3.85	3.85	3.80	3.80	5.40	3.50	4.85	5.25	3.83	4.34	9.09	7.44
Milwaukee	3.63	3.53	3.53	3.68	3.68	5.28	3.18	4.23	4.73	3.54	3.88	8.38	6.98
St. Louis	3.64	3.74	3.74	3.69	3.69	5.29	3.39	4.24	4.99	3.61	4.02	8.77	7.12
Kansas City	4.05	4.15	4.15	4.00	4.00	5.60	3.90	....	5.00	....	4.30	....	....
Omaha	4.10	4.20	4.20	4.15	4.15	5.75	3.85	5.32	6.00	....	4.42	....	....
Memphis	4.15	4.35	4.35	4.20	4.20	5.96	4.35	....	6.00	....	4.56	....	....
Chattanooga	3.80	4.00	4.00	3.85	3.85	5.80	3.75	....	4.50	....	4.39	....	....
Tulsa, Okla.	4.44	4.34	4.34	4.49	4.49	6.09	4.19	....	5.79	....	4.69	....	....
Birmingham	3.50	3.70	3.70	3.55	3.55	5.93	3.45	....	4.75	....	4.43	....	....
New Orleans	4.00	4.10	4.10	3.80	3.80	5.75	3.85	....	4.80	5.00	4.60	....	....
Houston, Tex.	3.75	5.95	5.95	4.10	4.10	5.50	4.20	....	5.25	....	7.15	....	....
Seattle	4.00	4.00	5.20	4.75	4.75	6.50	4.75	7.25	6.00	....	5.75	....	....
Portland, Oreg.	4.25	4.50	6.10	4.00	4.00	5.75	3.95	6.50	5.00	....	5.75	....	....
Los Angeles	4.15	5.45	7.25	4.95	4.95	7.20	5.10	7.30	6.30	....	6.60	11.35	10.35
San Francisco	4.00	5.20	6.80	4.70	4.70	6.40	4.70	7.20	6.45	....	7.05	11.60	10.60

	S.A.E. Hot-rolled Bars (Unannealed): 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series
Boston	4.28	7.75	6.05	5.80	7.90
New York (Met.)	4.04	7.60	5.90	5.65	....
Philadelphia	4.10	7.56	5.86	5.61	8.56
Baltimore	4.45	....	....	....	....
Norfolk, Va.	....	....	....	....	....
Buffalo	3.55	7.35	5.65	5.40	7.50
Pittsburgh	3.40	7.45	5.75	5.50	7.60
Cleveland	3.30	7.55	5.85	5.85	7.70
Detroit	3.48	7.67	5.97	5.72	7.19
Cincinnati	3.65	7.69	5.99	5.74	7.84
Chicago	3.70	7.35	5.65	5.40	7.50
Twin Cities	3.95	7.70	6.00	6.09	8.19
Milwaukee	3.83	7.33	5.88	5.63	7.73
St. Louis	3.84	7.72	6.02	5.77	7.87
Seattle	6.45	....	8.75	8.60	9.40
Portland, Oreg.	5.70	8.85	8.00	7.85	8.65
Los Angeles	4.80	9.55	8.55	8.40	9.05
San Francisco	6.05	10.60	9.60	9.45	10.10

BASE QUANTITIES

Soft Bars, Bands, Hoops, Plates, Shapes, Floor Plates, Hot Rolled Sheets and SAE 1035-1050 Bars: Base, 400-1999 pounds; 300-1999 pounds in Los Angeles; 400-39,999 (hoops, 0-299) in San Francisco; 300 pounds and over, Portland, Seattle; 400-14,999 Twin Cities; 400-3999 Birmingham; 400 pounds and over in Memphis; Los Angeles, bars over 4-in. wide, 1-in. thick, 4.95c.

Cold Rolled Sheets: Base, 400-1499 pounds in Chicago, Cincinnati, Cleveland, Detroit, New York, Omaha, Kansas City, St. Louis; 450-3749 in Boston; 500-1499 in Buffalo; 1000-1999 in Philadelphia, Baltimore; 750-4999 in San Francisco; 300-4999 in Portland, Seattle; any quantity in Twin Cities; 300-1999 Los Angeles.

Galvanized Sheets: Base, 150-1499 pounds, New York; 150-1499 in Cleveland, Pittsburgh, Baltimore, Norfolk; 1 to 10 bun. in Los Angeles; 300 and over in Portland, Seattle; 450-3749 in Boston; 500-1499 in Birmingham, Buffalo, Chicago, Cincinnati, Detroit, Indianapolis, Milwaukee, Omaha, St. Louis ,Tulsa; 3500 and over in Chattanooga; any quantity in Twin Cities; 750-1500 in Kansas City; 150 and over in Memphis; any quantity in Philadelphia; 750-4999 in San Francisco.

Cold Rolled Strip: No base quantity; extras apply on lots of all size.

Cold Finished Bars: Base, 1500 pounds and over on carbon, except 0-299 in San Francisco, 1000 and over in Portland, Seattle, 1 to 99 pounds in Los Angeles; 1000 pounds and over on alloy, except 0-4999 in San Francisco.

SAE Hot Rolled Alloy Bars: Base, 1000 pounds and over, except 0-4999, San Francisco; 0-1999, Portland, Seattle.

EUROPEAN IRON, STEEL PRICES

Dollars at $4.02½ per Pound Sterling

Export Prices f.o.b. Port of Dispatch—

By Cable or Radio

	BRITISH Gross Tons f.o.b. U.K. Ports	£ s d
Merchant bars, 3-inch and over	$66.50	16 10 0
Merchant bars, small, under 3-inch, re-rolled	3.60c	20 0 0
Structural shapes	2.95c	15 10 0
Ship plates	2.90c	16 2 6
Boiler plates	3.17c	17 12 6
Sheets, black, 24 gage	4.00c	22 5 0
Sheets, galvanized, corrugated, 24 gage	4.61c	25 12 6
Tin plate, base box, 20 x 14, 108 pounds	$ 6.20	1 10 9

British ferromanganese $120.00 delivered Atlantic seaboard duty-paid.

Domestic Prices Delivered at Works or Furnace—

		£ s d
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$25.79	6 8 0(a)
Basic pig iron	24.28	6 0 6(a)
Furnace coke, f.o.t. ovens	7.40	1 16 9
Billets, basic soft, 100-ton lots and over	49.37	12 5 0
Standard rails, 60 lbs. per yard, 500-ton lots & over	2.61c	14 10 6
Merchant bars, rounds and squares, under 3-inch	3.17c	17 12 0††
Shapes	2.77c	15 8 0††
Ship plates	2.91c	16 3 0††
Boiler plates	3.06c	17 0 6††
Sheets, black, 24 gage, 4-ton lots and over	4.10c	22 15 0
Sheets, galvanized 24 gage, corrugated, 4-ton lots & over	4.70c	26 2 6
Plain wire, mild drawn, catch weight coils, 2-ton lots and over	4.28c	23 15 0
Bands and strips, hot-rolled	3.30c	18 7 0

(a) del. Middlesbrough 5s rebate to approved customers. ††Rebate 15s on certain conditions.

Ores

Lake Superior Iron Ore

Gross ton, 51½%

Lower Lake Ports

Old range bessemer	$4.75
Mesabi nonbessemer	4.45
High phosphorus	4.35
Mesabi bessemer	4.60
Old range nonbessemer	4.60

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56-63%, contract	12.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Manganiferous ore, 45-55% Fe., 6-10% Mang.	Nom.
N. African low phos.	Nom.
Spanish, No. African basic, 50 to 60%	Nom.
Chinese wolframite, net ton, duty pd.	$24.00
Brazil Iron ore, 68-69%, crd.	7.50c
Low phos. (.02 max.)	8.00c

F.O.B. Rio Janeiro.

Scheelite, imp.	23.50-24.00
Chrome ore, Indian, 48% gross ton	....

Manganese Ore

Including war risk but not duty, cents per unit cargo lots

Caucasian, 50-52%	....
So. African, 50%	68.00-70.00
Indian, 50%	68.00-70.00
Brazilian, 46%	68.00-70.00
Chilean, 47%	68.00-70.00
Cuban, 50-51%, duty free	....

Molybdenum

Sulphide conc., lb., Mo. cont., mines	$0.75

MAXIMUM PRICES FIXED BY OPA ON IRON AND STEEL SCRAP

Other than railroad grades quoted on the basis of basing point prices from which shipping point prices and consumers' delivered prices are to be computed. Scrap originating from railroads quoted delivered to consumers' plants located on the line of the railroad from which the material originated. All prices in gross tons. A basing point includes its switching district.

	Pittsburgh, *Wheeling *Johnstown, Weirton, Steubenville	Youngstown, *Warren, Canton, Sharon	Chicago	Kokomo, Ind.	Bethlehem	*East. Pa.	Sparrows Pt.	Cleveland	Buffalo	Cincinnati Ashland, Ky. Portsmouth, O. Middletown, O.	St. Louis	Detroit	Duluth	Birmingham	Alabama City, Atlanta	*Pacific Coast	Minnequa, Colo.
OTHER THAN RAILROAD GRADES (a) (b)																	
No. 1 heavy melting	$20.00	$20.00	$18.75	$18.25	$18.25	$18.75	$18.75	$19.50	$19.25	$19.50	$17.50	$17.85	$18.00	$17.00	$17.00(d)	$14.50	$16.50
No. 1 hyd. comp. black sheets	20.00	20.00	18.75	18.25	18.25	18.75	18.75	19.50	19.25	19.50	17.50	17.85	18.00	17.00	17.00(d)	14.50	16.50
No. 2 heavy melting	19.00	19.00	17.75	17.25	17.25	17.75	17.75	18.50	18.25	18.50	16.50	16.85	17.00	16.00	16.00(d)	13.50	15.50
Dealer No. 1 bundles	19.00	19.00	17.75	17.25	17.25	17.75	17.75	18.50	18.25	18.50	16.50	16.85	17.00	16.00	16.00(d)	13.50	15.50
Dealer No. 2 bundles	18.00	18.00	16.75	16.25	16.25	16.75	16.75	17.50	17.25	17.50	15.50	15.85	16.00	15.00	15.00(d)	12.50	14.50
Mixed borings and turnings	15.25	15.25	14.00	14.25	13.50	14.00	14.00	14.75	14.50	14.75	12.75	13.10	.....	12.25	12.25	9.75	11.75
Machine shop turnings	15.50	15.50	14.25	14.50	13.75	14.25	14.25	15.00	14.75	15.00	13.00	13.35	15.50	15.00	15.00	10.00	12.00
Shovel turnings	16.50	16.50	15.25	15.50	14.75	15.25	15.25	16.00	15.75	16.00	14.00	14.35	16.50	16.00	16.00	11.00	13.00
No. 1 busheling	19.50	19.50	18.25	17.75	17.75	18.25	18.25	19.00	18.75	19.00	17.00	17.35	17.50	16.50	16.50	14.00	16.00
No. 2 busheling	15.50	15.50	14.25	13.75	13.75	14.25	14.25	15.00	14.75	15.00	13.00	13.35	13.50	12.50	12.50	10.00	12.00
Cast iron borings	15.75	15.75	14.50	14.00	14.00	14.50	14.50	15.25	15.00	†15.25	13.25	13.60	13.75	12.75	12.75	10.25	12.25
Uncut structurals and plate	19.00	19.00	17.75	17.25	17.25	17.75	17.75	18.50	18.25	18.50	18.50	16.85	17.00	16.00	16.00	13.50	15.50
No. 1 cupola	21.00	21.00	20.00	20.00	22.50	23.00	22.00	22.00	20.00	21.00	20.00	20.35	19.00	20.00	.....	18.00	.....
Heavy breakable cast	19.50	19.50	18.50	18.50	21.00	21.50	21.00	20.50	18.50	19.50	18.50	18.85	17.50	18.50	.....	17.00	.....
Stove plate	19.00	.....	17.00	16.00	18.00	18.50	18.00	18.00	19.00	17.50	17.00	14.10	16.00	17.00	.....	14.00	.....
Low phos. billet, bloom crops	25.00	25.00	23.75	23.75	23.25	23.75	23.75	24.50	24.25	23.50	22.50	22.85	23.00	22.00	.....	19.50	.....
Low phos. bar crops and smaller	23.00	23.00	21.75	21.75	21.25	21.75	21.75	22.50	22.25	21.50	20.50	20.85	21.00	20.00	.....	19.50	.....
Low phos. punch., plate scrap**	23.00(c)	23.00	21.75	21.75	21.25	21.75	21.75	22.50	22.25	21.50	20.50	20.85	21.00	20.00	.....	17.50	.....
Machinery cast cupola size***	22.00	22.00	21.00	21.00	23.50	24.00	23.50	23.00	21.00	22.00	21.00	21.35	20.00	21.00	.....	19.00	.....
No. 1 machine cast, drop broken, 150 pounds and under	22.50	22.50	21.50	21.50	24.00	24.50	24.00	23.50	21.50	22.50	21.50	21.85	20.50	21.50	.....	19.50	.....
Clean auto cast	22.50	22.50	21.50	21.50	24.00	24.50	24.00	23.50	21.50	22.50	21.50	21.85	20.50	21.50	.....	19.50	.....
Punchings and plate scrap††	22.00(c)	22.00	20.75	20.75	20.25	20.75	20.75	21.50	21.25	20.50	19.50	19.85	20.00	19.00	.....	16.50	.....
Punchings and plate scrap§§	21.00(c)	21.00	19.75	19.75	19.25	19.75	19.75	20.50	20.25	19.50	18.50	18.85	19.00	18.00	.....	15.50	.....
Heavy axle and forge turnings	19.50(c)	19.50	18.25	18.25	17.75	18.25	18.25	19.00	18.75	18.00	17.00	17.35	17.50	16.50	.....	14.00	.....
Medium heavy elec. furnace turnings	18.00(c)	18.00	16.75	16.75	16.25	16.75	16.75	17.50	17.25	16.50	15.50	15.85	16.00	15.00	.....	12.50	.....
GRADES ORIGINATING FROM RAILROADS															Kansas City		
No. 1 R.R. heavy melting steel	21.00	21.00	19.75	19.25	.....	19.75	19.75	20.50	20.25	20.50	18.50	18.85	19.00	18.00	17.00	15.50	.....
Scrap rails	22.00	22.00	20.75	20.25	.....	20.75	20.75	21.50	21.25	21.50	19.50	19.85	20.00	19.00	18.00	16.50	.....
††Rerolling quality rails	23.50	23.50	22.25	21.75	.....	22.25	22.25	23.00	22.75	23.00	21.00	21.35	21.50	20.50	19.50	18.00	.....
Scrap rails 3 feet and under	24.00	24.00	22.75	22.25	.....	22.75	22.75	23.50	23.25	23.50	21.50	21.85	22.00	21.00	20.00	18.50	.....
Scrap rails 2 feet and under	24.25	24.25	23.00	22.50	.....	23.00	23.00	23.75	23.50	23.75	21.75	22.10	22.25	21.25	20.25	18.75	.....
Scrap rails 18 inches and under	24.50	24.50	23.25	22.75	.....	23.25	23.25	24.00	23.75	24.00	22.00	22.35	22.50	21.50	20.50	19.00	.....

*Johnstown, Pa., and Warren, O., are not bases for railroad grades; Wheeling railroad only. Eastern Pa. includes Coatesville, Claymont, Conshohocken, Phoenixville and Harrisburg as bases only for "other than railroad grades"; Philadelphia and Wilmington are bases only for railroad grades. Pacific Coast bases are Los Angeles, San Francisco, Seattle, Portland. †Base price at Portsmouth; Middletown 25 cents less and Ashland, Ky; ††The term 'rails for rerolling' includes any rails which are sold to be used for rerolling, irrespective of whether or not such rails are usable for re-laying. **⅜-inch and heavier, cut 12 inches and under; ***may include clean agricultural cast; ‡‡under ⅜-inch to ¼-inch, cut 12 inches and under; §§under ¼-inch to No. 12 gage, cut 12 inches and under. (c) add $1.75 at Pittsburgh. (d) Bases at Atlanta only.

OTHER BASE PRICES: Machine shop turnings $17.60, Alloy, W. Va., $13.35 Toledo, O.; **Shoveling turnings,** $14.35 Toledo; **cast iron borings,** $13.60 Toledo; **No. 1 cupola cast,** $19 Minneapolis and St. Paul, $20.50 Chattanooga, $21 Radford, Va. and $22 Phillipsdale, Bridgeport and Worcester; **Heavy breakable cast,** $20.50 Phillipsdale, Bridgeport and Worcester, $17.50 Minneapolis and St. Paul; **Stove plate** $16 Minneapolis and St. Paul, $17.50 Chattanooga, $18 Radford, Va., $15.60 Toledo and $17.50 Phillipsdale, Bridgeport and Worcester; **Machinery cast cupola size** $21.50 Chattanooga, $22 Radford, Va. and $23 Phillipsdale, Bridgeport and Worcester; **No. 1 machinery cast, drop broken** $22 Chattanooga, $22.50 Radford, Va. and $23.50 Phillipsdale, Bridgeport and Worcester; **Clean auto cast** $22 Chattanooga, $22.50 Radford, Va. and $23.50 Phillipsdale, Bridgeport and Worcester.

(a) The grades specified are, except dealers' No. 1 and No. 2 bundles and uncut structural and plate scrap, as named and defined in the simplified recommendations R-58-36 of the Department of Commerce which shall be the governing specifications for iron and steel scrap hereunder (other than railroad grades). Dealers' No. 1 bundles shall consist of new, clean black sheet scrap, hydraulically compressed in the dealer's yard. Dealers' No. 2 bundles shall consist of old fender and body scrap, and shall in no case command a premium. (b) These grades (other than railroad grades) represent the major classifications of iron and steel scrap. The maximum prices of superior or inferior grades shall continue to bear the same comparable relationship to those major grade classifications as heretofore existed between the prices of such superior or inferior grades and the prices of the major grades.

Maximum price at shipping point: A shipping point is the point from which the scrap is to be shipped to a consumer. Maximum price at which a grade of scrap may be sold f.o.b. its point of shipment is the shipping point of such scrap. **For shipping points located within a basing point,** the shipping point price is determined by taking the basing point price and deducting actual transportation costs to the consumer's plant within the basing point. **For shipping points outside a basing point,** the shipping point price is determined by taking the nearest basing point and subtracting the lowest transportation charge. (Example: No. 1 steel shipped from Toledo takes the Detroit base of $17.85 minus transportation of $1.52 or $16.33. This shipping point price is the same to all consumers wherever located.) **Exceptions:** Shipping point of any grade not listed as having a basing point in New England is the Johnstown base minus the all-rail freight from the shipping point to Johnstown. Shipping point prices for New York City, Brooklyn, New York and New Jersey must be computed on the basis of the Bethlehem base although nearer to Buffalo in terms of barge transportation.

Maximum prices to consumers: Maximum price at which any grade (other than railroad) may be delivered to a consumer wherever located is the shipping point price plus actual transportation charges. Where shipment is by water, not more than 75 cents per gross ton may be included for handling charges at dock. Maximum delivered price in no case shall exceed by $1 a ton the nearest maximum base price in terms of transportation charges. (Example: The $1 excess is the so-called "springboard" arrangement. Youngstown consumers can draw on the Cleveland area for No. 1 steel scrap by taking the Cleveland base of $19.50, subtracting the Cleveland switching charge of 65 cents and adding freight to Youngstown of $2.08. The resulting delivered figure of $20.93 is within the "springboard" limit of $1 over the Youngstown base of $20.)

Billet and bloom crops originating in the Pittsburgh district may be sold within or without the district at the Pittsburgh base price plus up to, but not more than $2.50 in transportation charges. Maximum prices for **unprepared scrap** shall be $2.50 a ton less than the maximums for corresponding grade or grades of prepared scrap. **Remote scrap** is material located beyond the zone from which the railroad freight rate to Pittsburgh is $11.20 and a consumer may obtain permission from OPACS to absorb transportation charges necessary to obtain 500 tons or more.

Railroad grades: Where a railroad operates in two or more basing points, the highest base applies to consumers anywhere on the line. (Example: New York Central Railroad uses the $21 Pittsburgh base on No. 1 steel since the P. & L. E. operates there). Exception: Switching charges of 84 cents a ton must be subtracted from prices on scrap originating from railroads operating in Chicago and sold for consumption outside Chicago. Where railroad scrap is shipped to an off-the-line consumer, the highest maximum on-the-line price or the nearest basing point price, whichever is higher, applies.

Commissions: Brokers are allowed a commission up to 50 cents a ton above maximum prices to consumers, including export.

Export prices: Maximum on No. 1 heavy melting steel (other than railroad) is the domestic shipping point price plus lowest transportation charge to point of export. Maximum price to a domestic consumer on line of the originating railroad plus transportation to point of export applies on No. 1 railroad steel. Customary differentials apply on other railroad and non-railroad grades.

Sheets, Strip

Sheet & Strip Prices, Page 122

Most sheet sellers have not entered orders for first quarter except on rated tonnage, and some of the latter with low preference have not been given place on books. Some mills are planning to lay out tentative schedules shortly, after study of specifications on hand and estimated consumer requirements.

While first quarter quotas for warehouses have not been established a number of resellers are filing specifications for such consideration as mills may be able to give them.

In general the proportion of sheet tonnage shipped in October for defense needs exceeded previous months and this trend is expected to continue. Defense share in production ranges upward from 60 per cent. Reduced allowance for manufacturers of various household appliances is being balanced in large measure by defense work taken by the same manufacturers.

Manufacturers of civilian goods are meeting considerable success in obtaining defense contracts. Usually a limited retooling program is necessary to change from regular lines. Florence Stove Co., Gardner, Mass., has been awarded a contract for ammunition boxes in addition to previous contracts for dies, tools, jigs, fixtures and gages. It has booked more than $500,000 worth of defense contracts. In New England small tank manufacturers are being adversely affected and have released more welders. Tackmakers as a rule have sufficient tack plate in stock for current needs. Manufacture of army shoes creates heavy demand for tacks and other defense work calls for them in unusual channels.

Business in sheet seconds is difficult, distributors and consumers normally taking off grades finding it almost impossible to obtain supplies. Corrugated roofing sheets are in short supply.

Plates

Plate Prices, Page 122

Plate allocations for November are on about the same basis as in October, although some producers are revamping shipping schedules to conform to the program approved at the beginning of the month.

Plate demand continues heaviest of all steel products, shipbuilding, freight car building and military tanks, all of high priority, representing a tremendous total.

Shipyards are pressing for resumption of heavier deliveries after a period of several weeks when shipments were held back until inventories were reduced. Shipbuilding is reaching theoretical peak, although additional ways and fitting piers are being constructed. Some yards already are at capacity.

Spotty improvement is noted in lighter plate deliveries but wider and heavier material cannot be delivered before first quarter on most inquiries.

Warehouse replacement are below estimates under the quota and buyers of miscellaneous small lots frequently are unable to place needed tonnage.

PLATE CONTRACTS PLACED

1850 tons, storage tanks, Alaska, for U. S. Army, to James G. Heggie & Sons Inc., Joliet, Ill.

850 tons, including shapes, to unstated interest, for six 100-foot tugs for Maritime Commission; Birchfield Boiler Works, Tacoma, contractor.

175 tons, 400,000-gallon elevated water tank, Gunter Field, Montgomery Ala., to Chicago Bridge & Iron Co., Chicago; bids Oct. 27, to U. S. engineer, Mobile, Ala., pro. 239.

100 tons or more, storage tanks, U. S. Corps of Engineers, War Department, to Birmingham Tank Co. division, Ingalls Iron Works Co., Birmingham, Ala.

Unstated tonnage, twenty 52-foot lengths, 30-inch i.d. steel discharge pipe, U. S. Engineer, New Orleans, to Lancaster Iron Works, Lancaster, Pa., $859.50 a length, inv. 123, bids Oct. 13.

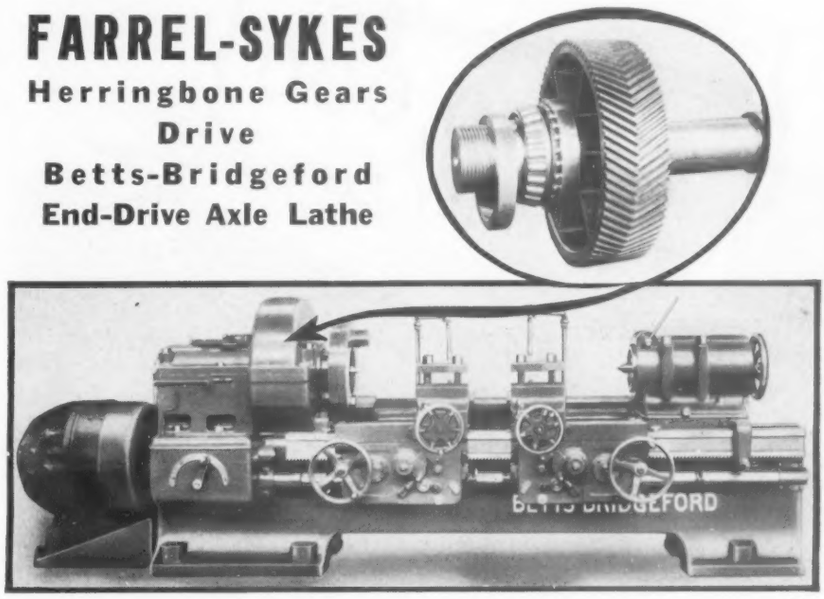
PLATE CONTRACTS PENDING

100 tons or more, two wind tunnels, model basin, Carderock, Md., Darby Corp., Kansas City, Kans., low, $96,884; Pittsburgh-Des Moines Steel Co., Pittsburgh, $142,840, and Chicago Bridge & Iron Co., Chicago, $149,800; bids Oct. 22, spec. 10367, Bureau of Yards & Docks, Navy Dept., Washington.

Unstated tonnage, 100 16-foot lengths, 18-inch i. d. steel shore pipe, seriel 90, U. S. Engineer, Washington; Bids Nov. 14; also 25 42-foot lengths pontoon pipe, seriel 89.

FARREL-SYKES

Herringbone Gears
Drive
Betts-Bridgeford
End-Drive Axle Lathe



Built for long-lived accuracy and durability in the heavy-duty service of rough and finish turning of locomotive axles and similar heavy forgings, the Betts-Bridgeford End-Drive Axle Lathe is driven by Farrel-Sykes Continuous Tooth Herringbone Gears.

The Consolidated Machine Tool Corporation has designed this lathe with special features to eliminate the chief causes of inaccuracy in heavy duty lathes of standard design. Consolidated's choice of Farrel-Sykes Herringbone Gears is based upon their record for dependable performance, smoothness of operation and long life under the most severe operating conditions.

Farrel-Sykes Gears are proportioned for extra strength and load-carrying capacity to withstand shocks, stresses and wear. The combined characteristics of overlap or interlacing of the teeth, gradual engagement and inclined line of pressure contribute to smooth, quiet operation and maintenance of correct tooth action throughout the life of the gears.

Farrel-Sykes Gears are designed for all types of machine tool applications. In adding improved features to your machines we invite you to consult Farrel engineers on specific problems involving gears.

FARREL SYKES GEARS

FARREL-BIRMINGHAM COMPANY, Inc.
322 VULCAN STREET - - - - - - - - BUFFALO, N. Y.
The Gear with a Backbone

Bars

Bar Prices, Page 123

Steel bar production is at a high rate but the situation is tight and is expected to be further complicated within the next few weeks by allocation of a heavy tonnage of shell rounds. With this in view, producers are tightening on bookings for other than defense use. Imposition of the shell steel will set back a great deal of tonnage now on books with only moderate priority.

Gun mounts, for which substantial contracts have been placed recently, require large tonnages of bars, as well as other steel, which is now being figured. Among manufacturers recently given gun mount contracts are Worthington Pump & Machinery Corp., Harrison, N. J., and Easy Washing Machine Co., Syracuse, N. Y. Supplemental orders for small arms continue to be placed, notably in the Hartford, Conn., district, and a large revolver contract has gone to a shop in Worcester, Mass.

Nondefense consumers are unable to obtain bookings with delivery promise and orders placed weeks ago are still undelivered. Few requests of this class are being received. Forging and chain shops are heavily booked and are specifying freely. Movement through warehouses has slackened, most tonnage being placed direct with mills.

Large orders with high ratings are being placed, some deliveries being into second quarter next year.

Manufacture of small arms in New England has not reached peak production but is approaching that mark. New machine tools recently installed are calling for increased material, much being alloy grades. Further installations are being made, which will add to steel demand.

Pipe

Pipe Prices, Page 123

Demand for pipe continues heavy, with sales from distributor stocks at a high rate. Inventories of consumers are being reduced steadily and warehouses are not receiving sufficient to meet demand.

Cast pipe foundries in most instances are making better deliveries as a result of larger supplies of pig iron. Some eastern foundries will need increased pig iron allotments to fill recent defense orders. Pipe foundries are unable to build up normal pipe inventories and fittings are in small supply.

New York city will ask bids soon for more than 10,000 tons of cement-lined pipe but probably will require better than its A-10 rating to obtain early delivery.

CAST PIPE PLACED

150 tons, Elachoman water project, Cathlemet, Wash., to Hugh G. Purcell, Seattle, for U. S. Pipe & Foundry Co., Burlington, N. J.

CAST PIPE PENDING

100 tons or more, additional projects at Fort Lewis, Wash., bids in.

Unstated, replacements and extensions, municipal water system, Kelso, Wash.; bids Nov. 4.

Unstated, expansion of water supply and distribution system, Anchorage, Alaska; bids soon; $265,000 allotted.

Wire

Wire Prices, Page 123

Diversion of steel ingots to other purposes is limiting productjon of wire rods in increasing degree and this is reflected in shortened output of finished wire products. Some eastern mills probably will produce less finished tonnage this month than last, even mills supplying their own rods. Orders and specifications in the experience of some mills are below current shipments and some reduction in backlogs is apparent. Ratio of defense-rated tonnage to the whole mounts steadily.

New England mills, with a preponderance of specialty material requiring long processing, notably spring steel and heat-treated items, make little progress in whittling down backlogs.

Nail shortage continues acute. Wire stocks of manufacturers and warehouses are low and in most cases insufficient to meet current needs.

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FREE Write for your metal rule for measuring lockwashers, bolts, etc. Dept. SM.

DIAMOND G LOCKWASHERS

Rails, Cars

Track Material Prices, Page 123

Domestic freight car buying in October, 2499 units, was the lowest for any month this year. However, total cars placed in ten months, 110,871 units, was the highest for that period in a number of years. Further comparisons follow:

	1941	1940	1939	1938
Jan.....	15,169	360	3	25
Feb.....	5.508	1,147	2,259	109
March...	8,074	3,104	800	680
April....	14,645	2,077	3,095	15
May.....	18,630	2,010	2,051	6,014
June	32,749	7,475	1,324	1,178
July.....	6,459	5,846	110	0
Aug.....	2,668	7,525	2,814	182
Sept.....	4,470	9,735	23,000	1,750
Oct.....	2,499	12,195	19,634	2,537
10 mos...	110,871	51,474	55,090	12,590
Nov.....	.....	8,234	2,650	1,232
Dec.....	.....	7,181	35	2,581
Total ..	.....	66,889	57,775	16,303

Pennsylvania railroad is reconditioning 3000 freight cars per month and will build 11,876 freight cars in its shops. Its program also includes building 25 locomotives and heavy repairs to 200 locomotives per month. This will add 9600 cars to available supply by the end of this year and 23,000 by Oct. 1 1942, when cars needing repair will be reduced to 3.4 per cent.

LOCOMOTIVES PLACED

American Steel & Wire Co., one 45-ton diesel-electric locomotive, to Whitcomb Locomotive Co., Rochelle, Ill.

Baltimore & Ohio Chicago Terminal, 10 diesel-electric switch engines, six of 600 horsepower and four of 1000 horsepower, to the Electro-Motive Corp., La Grange, Ill.

Chicago & North Western, one 1000-horsepower and one 660-horsepower switch engine, to American Locomotive Co., New York.

Mississippi Export, one 44-ton diesel-electric switch engine to General Electric Co., Schenectady, N. Y.

New Orleans Public Belt, three 660-horsepower diesel-electric switch engines, to Baldwin Locomotive Works, Eddystone, Pa.

Richmond, Fredericksburg & Potomac, two 660-horsepower diesel-electric switch engines, to American Locomotive Co., New York.

Upper Merion & Plymouth, one 660-horsepower diesel-electric switch engine to Baldwin Locomotive Works, Eddystone, Pa.

LOCOMOTIVES PENDING

Delaware & Hudson, 10 to 15, 4-8-4 type steam locomotives, bids asked.

CAR ORDERS PLACED

Bessemer & Lake Erie, 925 freight cars, with 200 gondolas going to Pressed Steel Car Co., Pittsburgh; 300 gondolas to Greenville Steel Car Co., Greenville, Pa., and 425 hoppers to the Pullman-Standard Car Mfg. Co., Chicago.

CAR ORDERS PENDING

Mesta Machine Co., six 70-ton gondolas, bids asked.

National Railways of Mexico, 200 fifty-ton tank cars, reported placed.

Navy, Bureau of Supplies and Accounts, five 50-ton flats, Hingham, Mass.; two, Iona Island, N. Y.; eight, Portsmouth, Va.; six, Charleston, S. C.; 18, Burns City, Ind.; six Fallbrook, Calif.; 10, Mare Island, Calif.; six Thorne, Nev.; also 15 50-ton box, Hingham, Mass.; 10, Iona Island; 12, Portsmouth, Va.; 10, Charleston, S. C.; 30, Burns City, Ind.; 10, Fallbrook, Calif.; 10, Mare Island, Calif.; four, Thorne, Nev.; sch. 9344, bids Nov. 21, Washington.

Pittsburgh & West Virginia, 100 fifty-ton box cars, pending.

BUSES BOOKED

A.c.f. Motors Co., New York: Twelve for Virginia Stage Lines Inc., Charlottesville, Va.; four for Vermont Transit Co., Burlington, Vt.; five air-conditioned for Carolina Coach Co., Roanoke, Va.; one for Southeastern Greyhound Lines, Lexington, Ky.

Tin Plate

Tin Plate Prices, Page 122

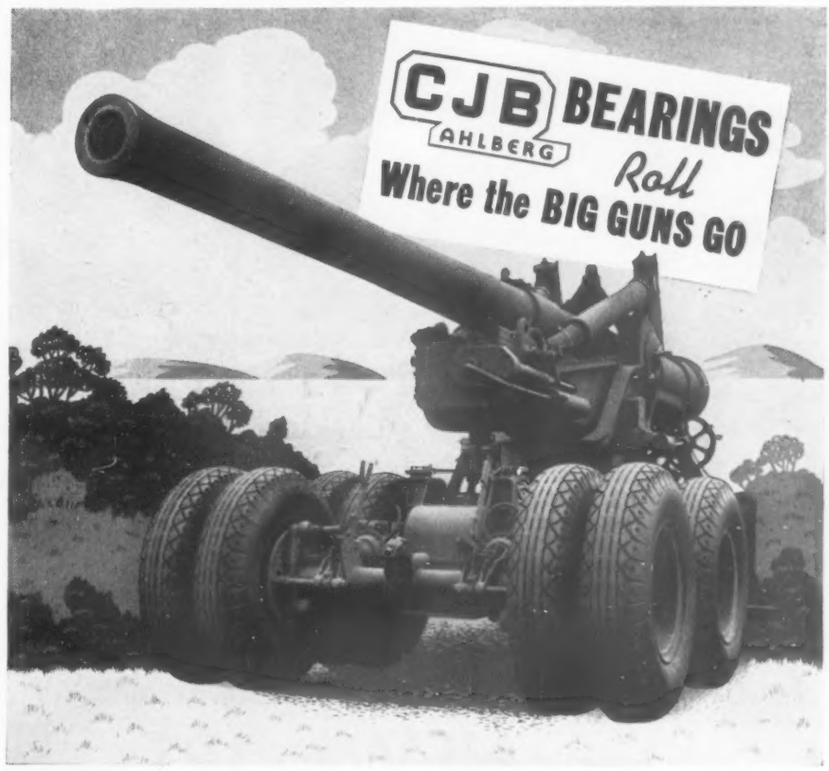
Except for tin plate tonnage shipped to British colonies under lease-lend contracts there has been little priority or allocation in this market. This is expected to change before long as demand for semi-finished steel limits tonnage possible to furnish makers of plate for tinning.

Demand from other users has taken up the slack resulting from the vegetable canning season being ended. Some of these had been held back to provide sufficient for needs of canners.

Structural Shapes

Structural Shape Prices, Page 123

Demand for structural shapes from building industries continues to decline but a number of large defense projects are pending, ex-



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pected to be awarded soon. Demand from other sources continues heavy. Fabricators continue at capacity on large tonnages yet unfilled.

Export of semifinished steel and diversion of this material to other purposes is limiting production of shapes by some mills. Plain material is becoming scarce as a result.

An important letting last week involved 4100 tons for an airplane engine supercharger plant for General Electric Co., at Fort Wayne, Ind., to be built by the government.

SHAPE CONTRACTS PLACED

4100 tons, airplane engine supercharger plant, General Electric Co., Ft. Wayne, Ind., to American Bridge Co., Pittsburgh; Stone & Webster Engineering Corp., Boston, contractor.

2700 tons, plant, Jacobs Aircraft Engine Co., Pottstown, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

2000 tons, two piers and seven warehouses, Scoffield Barracks, T. H., to Bethlehem Steel Co., San Francisco.

2000 tons, additional, Boeing Airplane Co., plant, Seattle, to Bethlehem Steel Co., San Francisco.

1800 tons, laboratory and test building, navy yard, Brooklyn, N. Y., to Lehigh Structural Steel Co., Allentown, Pa.; Thompson-Starrett Co., New York, contractor.

950 tons, estimated, airplane hangars, Corps of Engineers, War Department, to Blaw-Knox Co., Pittsburgh.

640 tons, demountable hangars, airport, Mesa, Ariz., to Allison Steel Mfg. Co., Phoenix, Ariz.

590 tons, radial gates for spillway, Ocoee No. 3 dam, Ducktown and Farner, Tenn., for Tennessee Valley Authority, to American Bridge Co., Pittsburgh.

565 tons, Bulkley boulevard grade separation, Cleveland, for state, to American Bridge Co., Pittsburgh.

500 tons, switch structures for Coulee project, to Bethlehem Steel Co.

455 tons, Advanced Twin Engine Flying school, Columbus, Miss., divided, 275 tons to Bethlehem Steel Co., Bethlehem, Pa., and 180 tons, to Chicago Bridge & Iron Co., Chicago; reinforcing bars to several distributors; U. S. Engineer, Mobile, Ala.

400 tons, mine shafts, Penokee Ore Co., Ironwood, Mich., to Worden-Allen Co., Milwaukee.

385 tons, coke and ore bins, Interlake Iron Corp., Duluth, Minn., to American Bridge Co., Pittsburgh.

300 tons, shops and foundry, Keyport naval torpedo station, Washington state, to unnamed interest; Bailey Construction Co., Seattle, contractor.

270 tons, state highway bridge, Wayne county, Pennsylvania, to Pine Brook Structural Co., Scranton, Pa., through Roser Construction Co., Wilkes-Barre, Pa.

225 tons, extension to coal handling equipment, Philo plant, Philo, O., Ohio Power Co., to American Bridge Co., Pittsburgh.

180 tons, bridge caps, various locations, for Northern Pacific railroad, to American Bridge Co., Pittsburgh.

150 tons, shop addition, Houde Engineering Corp., Buffalo, to R. S. McMannus Steel Construction Co., Buffalo; Charles Berrick Sons Co., Buffalo, contractor.

140 tons, shop building, C-O-Two Fire Equipment Co., Port Newark, N. J., to Belmont Iron Works, Philadelphia; Wigton-Abbott Corp., Plainfield, N. J., contractor; reinforcing bars to Bethlehem Steel Co., Bethlehem, Pa.

105 tons, two storage buildings, ammunition depot, Hingham, Mass., to Grossier & Schlager Iron Works, Somerville, Mass.; T. Stuart & Son Co., Watertown, Mass., contractor.

100 tons, American Bosch Corp., Springfield, Mass., to American Bridge Co., Pittsburgh, Brown & Matthews Co., New York, contractor.

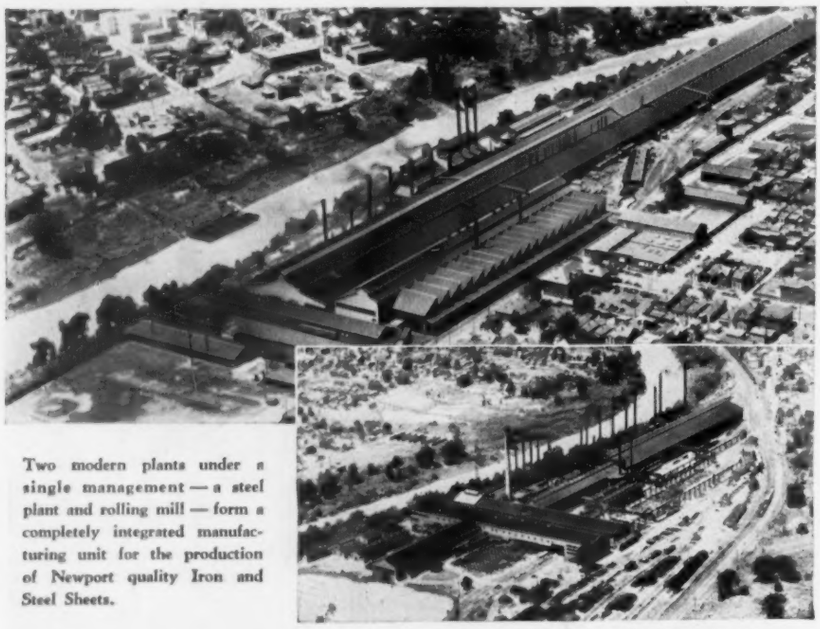
100 tons, shapes and reinforcing, buildings and miscellaneous work, ordnance area, airport, Manchester, N. H., to Consolidated Iron Works, Manchester, and Northern Steel Co., Boston; Grande & Volpe, Malden, Mass., contractors.

100 tons or more, jib cranes, piers 317B and 352, navy yard, Charleston, S. C., to Lakeside Bridge & Steel Co., Milwaukee, $501,040, Bureau of Yards and Docks, Navy Department, spec. 10362, also 10 full revolving jib cranes, mounted on traveling gantry bases, dry docks 5 and 6, navy yard, Brooklyn, to American Hoist & Derrick Co., St. Paul, $1,677,000, f.o.b. cars, New York city, spec. 10523.

SHAPE AWARDS COMPARED

	Tons
Week ended Nov. 8	18,755
Week ended Nov. 1	12,510
Week ended Oct. 25	44,230
This week, 1940	28,000
Weekly average, 1941	28,492
Weekly average, 1940	21,326
Weekly average, Oct., 1941	22,530
Total to date, 1940	1,276,756
Total to date, 1941	1,282,122

Includes awards of 100 tons or more.



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ANDREWS PRODUCTS IN BASIC OPEN-HEARTH CARBON AND ALLOY STEEL: BARS • PLATES • UNIVERSAL MILL PLATES • SHEET BARS • BILLETS • BLOOMS • SLABS.

SHAPE CONTRACTS PENDING

15,000 tons, 27 buildings for quartermaster supply depot, Oakland, Calif.; being built of wood.

5000 tons, drydock, power plant, mooring and additional facilities, Pearl Harbor, T. H.; contract to Pacific Bridge Co., San Francisco.

2730 tons, extension of pump and blower sludge disposal building, West-Southwest sewage treatment works, division Q, Stickney, Ill., for Sanitary District of Chicago; Bethlehem Steel Co. low.

1950 tons, superstructure, contract 2, main viaduct, trafficway project, Kansas City, Mo.

1590 tons, penstock coaster gates, Spec. 1010, Grand Coulee dam, Odair, Wash., for Bureau of Reclamation.

1553 tons, trash racks, Shasta dam, Coram, Calif., U. S. Bureau of Reclamation, Inv. 1004; Joseph T. Ryerson & Son Inc., Chicago, low, bids Nov. 4.

1490 tons, camouflage building and hangar, Boeing Airplane Co., Wichita Falls, Kans.

910 tons, bridge over Roanoke river, Bracey, Va., for Seaboard Air Line railway.

680 tons, power house, Missouri Ordnance Works, Louisiana, Mo., for Defense Plant Corp.

560 tons, addition to buildings A and B, Lima, O., Westinghouse Electric & Mfg. Co.

425 tons, bridge over Tiger river, Delta, S. C., for Seaboard Air Line railway.

390 tons, shaft forging shop, Puget Sound navy yard, Bremerton, Wash.

360 tons, bridges, various locations, for Missouri Pacific railroad.

335 tons, trusses and beams, U. S. Engineer, Boston, inv. 60; bids Nov. 14.

335 tons, superstructure building 625 and extension building 607, Philadelphia navy yard.

305 tons, state highway bridge PSC-7263, Post Creek, N. Y.

280 tons, east extension to building 14, Pittsfield, Mass., General Electric Co.

225 tons, two a.c. hangars, 184-foot demountable, basic flying field, Waco, Tex., Inv. 144, U. S. Engineer, Galveston, Tex.; bids Oct. 15 rejected.

210 tons, state bridge over Kalamazoo river, Allegan, Mich.

185 tons, laundry building, Sunnyside yard, Long Island, N. Y., for Pennsylvania railroad.

165 tons, torpedo storage building, Hawthorne, Nev., for government.

145 tons, horse props, Bebout Weir units, Ohio river dams.

135 tons, state bridge over Manistee river, Mesick, Wexford county, Michigan.

130 tons, hangar building, Fairchild Engine & Airplane Corp., Ranger Air Engine division, Farmingdale, Long Island, N. Y.

115 tons, store building, J. C. Penney Co., Flint, Mich.

Unstated, towers and girders for tideflats electric substation; bids in to board of contracts, Tacoma, Wash.

Unstated, 15-ton traveling crane for Anderson dam warehouse, Idaho; Milwaukee Crane Service Co. low.

Fluorspar

Fluorspar Prices, Page 124

No shortage has appeared in fluorspar. Producers in the Middle West are under pressure for deliveries as elesewhere, but domestic sources of supply have continued to make satisfactory deliveries and this situation seems likely to continue indefinitely.

Reinforcing Bars

Reinforcing Bar Prices, Page 123

Reinforcing steel producers are bidding only on projects with high ratings, disregarding inquiries with low priority. Important defense requirements are being practically allocated. Recent inquiry for 970 tons for a filtered water reservoir at Washington brought out no bids. Distributors with unshipped tonnage against nondefense contracts booked some time ago have difficulty in completing deliveries. All export shipments are covered by priorities.

REINFORCING STEEL AWARDS

3050 tons, additional requirements, navy yard super drydock, Brooklyn, N. Y., to Bethlehem Steel Co., Bethlehem, Pa., through Dry Dock Associates.

2346 tons, War Department, inv. 54434, Balboa, Canal Zone, to Republic Steel Corp., Cleveland; Mahony-Troast Corp., contractor.

2313 tons, War Department, inv. 1409, Cristobal, Canal Zone, to Republic Steel Corp., Cleveland.

1500 tons, Remington small arms plant, Remasco, Colo., to Colorado Fuel & Iron Corp., Denver; Broderick & Gordon, contractor.

1400 tons, grade separations, Queens county, New York, to Bethlehem Steel Co., Bethlehem, Pa.; Garafano Construction Co., contractor.

950 tons, MacMillan reservoir, Washington, to Bethlehem Steel Co., Bethlehem,

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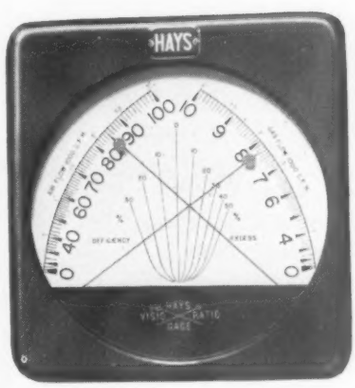

PATENTS PENDING. This gage is calibrated in terms of air and gas flow—but may be used for any two flows for which the instrument is calibrated.

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The HAYS CORPORATION
SINCE 1901 COMBUSTION INSTRUMENTS AND CONTROL
MICHIGAN CITY, INDIANA, U.S.A.

Pa.; Euclid Construction Co., contractor.

900 tons, crane foundations, navy yard drydock, Bayonne, N. J., to Bethlehem Steel Co., Bethlehem, Pa., through Bayonne Associates.

820 tons, aviation engine plant, Chevrolet Motor Co., Tonawanda, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; Darin & Armstrong, contractor.

800 tons, miscellaneous facilities, navy yard, Portsmouth, N. H., to Bethlehem Steel Co., Bethlehem, Pa.; Aberthaw Co., contractor.

780 tons, army air base requirements, Trinidad, B. W. I.; 450 tons to Youngstown Sheet & Tube Co., Youngstown, O., 330 tons to Jones & Laughlin Steel Corp., Pittsburgh.

750 tons, expansion, General Steel Castings Corp., Granite City, Ill., to Laclede Steel Co., St. Louis.

500 tons, buildings 131 and 199, navy yard, Boston, to Concrete Steel Co., Boston; Thomas O'Connor & Sons Co., Boston, contractor.

400 tons, building, Chesapeake & Potomac Telephone Co., Baltimore, to Bethlehem Steel Co., Bethlehem, Pa.

400 tons, shops and foundry Keyport, Wash., naval torpedo station, to unstated interest; Bailey Construction Co., Seattle, contractor.

325 tons, buildings, naval training station, Newport, R. I., to Truscon Steel Co., South Boston, Mass.; Ford, Bacon & Davis, New York, engineers.

300 tons, Union Pacific railroad requirements, Avery, Nebr., to Inland Steel Co., Chicago.

150 tons, navy yard storage building, Washington, to Bethlehem Steel Co., Bethlehem, Pa., through Diamond Construction Co.

150 tons, additional award, low rent housing project, Tex.-2R, Dallas, Tex., to Ceco Steel Products Corp., Dallas; A. J. Rife Construction Co., Dallas, contractor.

140 tons, test cells, Wright Aeronautical Corp., Paterson, N. J., to Republic Steel Corp., Cleveland, through Mahony-Troast Corp.

130 tons, water softening plant, Wright Aeronautical Corp., Lockland, O., to Pollak Steel Co., Cincinnati; F. Messer & Son, contractor.

130 tons, mesh, state highway project, Newington, Conn., to American Steel & Wire Co., Worcester, Mass.; L. C. Defelice & Son, New Haven, contractor.

120 tons, Norfolk navy yard housing, Portsmouth, Va., to Bethlehem Steel Co., Bethlehem, Pa., through Allen J. Saville.

116 tons, project FAP-122-A (2), Shawnee, Okla., to Sheffield Steel Corp., Kansas City, Mo., through Capitol Steel & Iron Co., Oklahoma City, Okla.; Ottinger Bros., contractor.

106 tons, Bureau of Reclamation invitation C-46225-A, Kremling, Colo., to Colorado Fuel & Iron Corp., Denver.

105 tons, radio school, Scott Field, Rantoul, Ill., to Laclede Steel Co., St. Louis.

100 tons, plant, Carbide & Carbon Chemical Corp., South Charleston, W. Va., to Inland Steel Co., Chicago.

REINFORCING STEEL PENDING

970 tons, South Filtered water reservoir, Washington; no bids received serial No. 977-42-68, U. S. Engineer, Washington, Oct. 24.

900 tons, power house superstructure, penstocks and surge tanks, Fort Peck, Mont.; bids Nov. 11 in Kansas City, Mo.

400 tons, gun turret plant, Briggs Mfg. Co., Detroit; W. E. Wood Co., contractor.

352 tons, U. S. Penitentiary, Bureau of Prisons, Terre Haute, Ind.; bids Nov. 10 to Chief Clerk.

319 tons, materials for Coulee dam; bids to Reclamation Bureau, Denver, Nov. 6.

257 tons, including 157 tons bars and 100 tons wire mesh, supercharger plant, Allis-Chalmers Mfg. Co., Milwaukee; bids Nov. 7.

250 tons, Rappahanock river bridge, Stafford county, Virginia.

250 tons, plant, Westinghouse Electric & Mfg. Co., Lester, Pa.

200 tons, Kingsbury Run sewer, Cleveland; bids Nov. 6.

200 tons, municipal filtration plant, Newport News, Va.; bids Nov. 5.

200 tons, municipal power plant, Lansing, Mich.

150 tons, city of Minneapolis coal dock, Minneapolis.

130 tons, flood wall project, U. S. Engineer, Mounds-Mound City, Ill.

125 tons, carbide storage building, navy yard, Portsmouth, N. H.

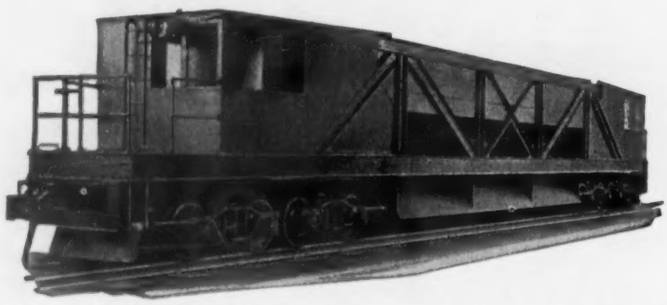
125 tons, track bolts, washers and track spikes for Boise-Payette project, Cascade, Idaho; bids to Denver, Nov. 12.

CONCRETE BARS COMPARED

	Tons
Week ended Nov. 8	18,781
Week ended Nov. 1	6,230
Week ended Oct. 25	14,522
This week, 1940	6,344
Weekly average, 1941	14,534
Weekly average, 1940	8,814
Weekly average, Oct., 1941	9,894
Total to date, 1940	432,890
Total to date, 1941	654,026

Includes awards of 100 tons or more.

ATLAS ORE TRANSFERS



100 ton—3 compartment Ore Transfer. Roller Bearing Journals. Double end control for car operation. Individually operated discharge gates.

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THE ATLAS CAR & MFG. CO.

Engineers . . . Manufacturers

CLEVELAND, OHIO

125 tons, mesh, highway project, route 35, section 38-A, Morgan to Laurence Harbor, Middlesex county, New Jersey; bids Nov. 21, E. Donald Sterner, state highway commissioner, Trenton.

103 tons, high school, White Fish Bay, Wis., project abandoned; bids Sept. 22.

100 tons, anhydrous ammonia plant, Henderson, Ky.

Unstated, addition to hospital Puget Sound navy yard; Hoard & Stingl, Seattle, low.

Unstated, state project, 182-foot concrete bridge, Umatilla county, Oregon; bids to highway commission, Portland, Nov. 12.

Pig Iron

Pig Iron Prices, Page 124

While pig iron distribution is regarded by the trade as being well handled it is becoming increasingly apparent that melters without ratings will have greater difficulty in obtaining tonnage. Some melters find it difficult to obtain as high rating on some types of work as was possible a few weeks ago. Users without priorities are feeling the pinch of small pig iron allotments and a severe shortage in cast scrap. Occasional instances are found where consumer stocks are greater than current need and no further shipments are allowed until inventory is reduced.

Foundries in machine tool centers have profited by increased demand for tools, castings for this purpose offsetting to some extent curtailment in nondefense work.

Iron, Steel Only Scrap Cheaper than Year Ago

Prices for scrap iron and steel now are lower than in November, 1940, and are the only waste material prices that have not advanced during the past year, according to the Department of Labor's Bureau of Labor Statistics.

The bureau's index of iron and steel scrap prices on Nov. 1 was 134, compared with 137.7 on Nov. 2, 1940.

Nonferrous scrap metal prices increased only slightly, from 131.2 to 133.5

Textile, paper and rubber waste prices advanced sharply. Textiles rose from 133.6 to 171.8; paper from 120.6 to 235.4; rubber from 134.6 to 206.7.

Tool Steel Scrap

Cents per pound, to consumers fo.b. shipping point

Tungsten Types

For each 1% tungsten contained

Solid scrap containing over 12%	1.80c
Solid scrap containing 5 to 12%	1.60
Turnings, millings containing over 12%	1.40
Turnings, millings, solids under 5%	1.25

Molybdenum Types

Solid scrap, not less than 7% molybdenum, 0.50 vanadium	12.50
Turnings, millings, same basis	10.50
Solid scrap, not less than 3% molybdenum, 4% tungsten, 0.50 vanadium	13.50
Turnings, millings, same basis	11.50

Scrap

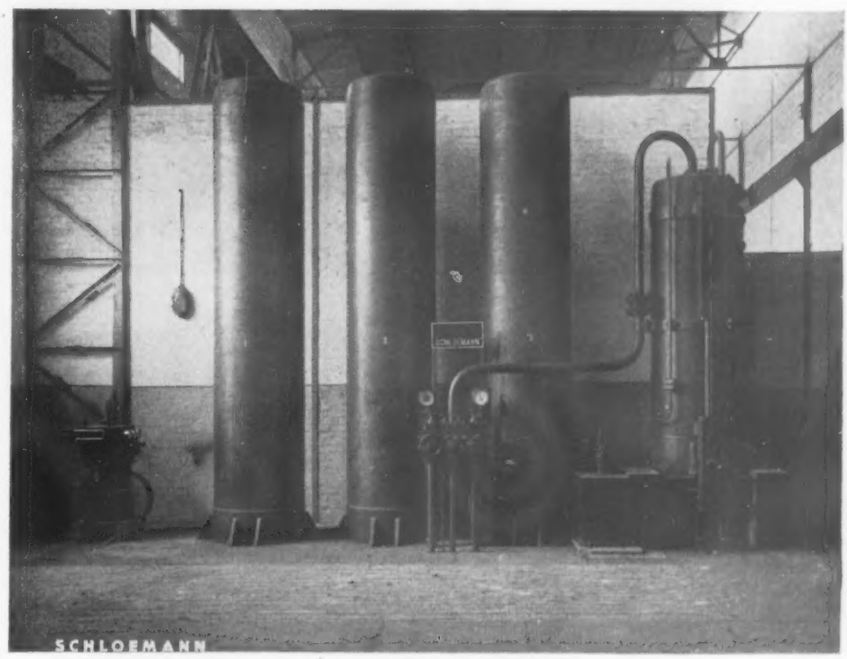
Scrap Prices, Page 126

While the scrap situation continues difficult occasional bright spots appear, relieving the situation at some consuming points. Six cargoes of scrap from the head of the lakes have been received at Buffalo during the past fortnight, bringing about 30,000 tons. In the St. Louis district deliveries have been sufficiently better for one melter to relight three open hearths.

Government interest in providing an adequate scrap supply is growing and a series of organized year-round scrap collection programs is being formulated covering nonferrous as well as steel and iron material. Department of Agriculture is moving through its state and county organizations to increase collection of scrap from farms, where a large tonnage is believed to be lying waste. It is believed the problem of collection is the most difficult to solve and that much scrap is available if it can be gathered and shipped.

Acute shortage in the case of many consumers is expected to bring increasing allocation before statistics of inventory are compiled and digested. Sufficient information is believed to be in hand to form the basis of a fairly effective job of rationing.

In the Chicago district the current volume of scrap receipts does



AIR-HYDRAULIC ACCUMULATOR

SCHLOEMANN Air-Hydraulic Accumulators are completely automatic. Fundamentally they consist of a Water Container, an Air Container and Electrically Controlled Regulating Apparatus.

The control of the water at the highest and lowest levels is by means of switches operated by floats contained in chambers of a communicating tube of the water bottle. The switch in the upper chamber controls the operation of the pump while that in the lower chamber controls the check valve which shuts off the accumulator at low water level.

- HYDRAULIC PRESSES
- EXTRUSION PRESSES
- HIGH PRESSURE PUMPS - DOUBLE ACTING DUPLEX TYPE
- ENGINEERING OF COMPLETE HYDRAULIC SYSTEMS

SCHLOEMANN
ENGINEERING CORP. PITTSBURGH, PA.
Rolling Mill Machinery Hydraulic Presses

not assure steel production beyond 30 days. One mill there continues to lose scrap by diversion to the Ohio valley.

In the Pittsburgh district dealers find their volume much below normal, one important interest handling only about one-third as much as in the summer.

One Detroit interest for the past fortnight has limited its scrap shipments diverting much of its supply to another mill badly in need of tonnage. A third blast furnace being rebuilt by Great Lakes Steel Corp. at Detroit, will be blown in before the end of the year, which will relieve the situation in open-hearth scrap but require supplies of blast furnace scrap.

Neither dealers or consumers are building reserves, the former preparing and shipping accumulations as rapidly as received and the latter in many cases operating hand-to-mouth on current shipments. Some small relief has been felt occasionally by receipt of remote scrap but there is no assurance of continued supply from these sources. Campaigns for collection from households and other private sources are yielding some returns but they are not significant.

Application of the allocation plan now being outlined at Washington is expected to be made in about another week and its results are awaited with interest, in view of the generally short supply.

Supply officer, navy yard, Washington, will sell under catalog 131-B, Nov. 18, approximately 1000 tons of nickel steel turnings and 150 tons of iron and steel scrap.

For Any Type of Steel Mill
MODERNIZATION or EXTENSION
Call BRASSERT
UNIFIED
Engineering and Construction Service
With minimum interference to your normal operations, plant extensions or modernization programs are completed promptly and efficiently by BRASSERT. Our broad experience and engineering skill are backed by complete construction facilities.
BRASSERT SERVICE INCLUDES
Consulting engineering covering raw materials, technical, commercial and financial aspects of present or prospective enterprises.
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Design and manufacture of specialized equipment and machinery.
H.A. BRASSERT & CO.
Engineers and Contractors
FIRST NATIONAL BANK BUILDING, PITTSBURGH, PA.
60 EAST 42nd STREET, NEW YORK CITY

Pacific Coast

San Francisco—Demand continues strong but little private work is coming out for figures. The structural market is active and 5311 tons were placed last week, bringing the aggregate for the year to 557,570 tons, compared with 335,635 tons for the corresponding period in 1940.

Practically all reinforcing bar rolling mills on the Pacific Coast are booked weeks in advance on national defense projects and little material is being released for private work. Awards totaled 3498 tons, bringing the aggregate to date to 154,237 tons, compared with 152,059 tons for the same period last year.

Seattle—Priority restrictions on general building are reflected in lower construction totals for October and also in curtailment of operations by several lumber plants. Defense requirements call for certain lumber specifications but other grades are accumulating, causing problems for the manufacturer.

Illustrating the effects of priorities, the Boise Water Corp., Boise, Idaho, has asked the city council to revoke an ordinance requiring that steel pipe be used in repairs and replacements.

Several important federal projects are developing, requiring large tonnages of concrete bars and shapes but details are not yet available. Increasing secrecy in these matters, particularly with reference to naval construction, is noted. Rolling mills are working to capacity to overcome backlogs. No quotations are out as all capacity is required to care for defense projects, navy, army and engineers placing tonnages almost daily as the situation develops.

Jobbing houses are short of stock, completely out of some items. Demand continues steady, with sheets, bars and plates particularly strong. Stock replacements in some cases are impossible within six months.

Scrap dealers complain of too much policing in their business although they claim there is no disposition to evade the regulations which in some instances are so involved as to be confusing. Receipts have dropped so that scrap yard equipment is being used to only 25 per cent of capacity. Rolling mills have ample stocks but with present scarcity the situation will shortly be acute.

Defense projects, partciularly cantonments and airfields, are calling for fair tonnages of cast iron pipe. Municipalities have plans in hand but many of these are postponed because of the difficulty of obtaining materials.

Nonferrous Metal Prices

Nov.	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
1-7	12.00	12.12½	11.75	52.00	52.00	5.85	5.70	8.25	15.00	14.00	35.00

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 12.00c Conn. copper

Sheets

Yellow brass (high)	19.48
Copper, hot rolled	20.87
Lead, cut to jobbers	9.10
Zinc, 100 lb. base	12.50-13.50

Tubes

High yellow brass	22.23
Seamless copper	21.37

Rods

High yellow brass	15.01
Copper, hot rolled	17.37

Anodes

Copper, untrimmed	18.12

Wire

Yellow brass (high)	19.73

OLD METALS

Dealers' Buying Prices

No. 1 Composition Red Brass

New York	10.00-10.25
Cleveland	10.50-10.75
Chicago	10.25-10.50
St. Louis	10.50

Heavy Copper and Wire

New York, No. 1	10.00
Cleveland, No. 1	10.00
Chicago, No. 1	10.00
St. Louis	10.00

Composition Brass Turnings

New York	9.37½-9.75

Light Copper

New York	8.00
Cleveland	8.00
Chicago	8.00
St. Louis	8.00

Light Brass

Cleveland	6.00-6.25
Chicago	6.00-6.25
St. Louis	6.25

Lead

New York	5.25-5.50
Cleveland	5.00-5.25
Chicago	4.75-5.00
St. Louis	4.75-5.00

Old Zinc

New York	5.00-5.25
Cleveland	4.00-4.12½
St. Louis	4.50-5.00

Aluminum

Mis., cast	11.00
Borings, No. 12	9.50
Other than No. 12	10.00
Clips, pure	13.00

SECONDARY METALS

Brass ingot, 85-5-5-5, l. c. l.	13.25
Standard No. 12 aluminum	14.50

Nonferrous Metals

New York — Following a statement by Leon Henderson that present lead prices are adequate to support a substantial increase in domestic output, William S. Knudsen and Sidney Hillman of OPM requested all lead miners to operate their properties at maximum productive capacity 24 hours a day, six days a week, and where possible, seven days.

Copper — Treasury Department has agreed to purchase entire output of Copper Range Co., Quincy Mining Co. and Isle Royale Copper Co. for a period of six months at prices up to maximums of 15.00c and 16.00c a pound. OPA has requested manufacturers of copper wire and cable used to conduct electricity not to exceed their Oct. 15 prices, while producers of brass sheet, rod and tube have agreed not to raise prices without first consulting OPA.

Lead—Consensus in the trade was that no substantial increase in production can be attained at present price levels, although one leading producer has increased operations to a 6-day from a 5-day week basis.

Zinc—Supply situation is improving with stocks having increased for the fourth consecutive month during October to 21,594 tons.

Tin—Offerings were freer as the equivalent Far Eastern price eased to around the OPA maximum price of 52.00c, New York.

■ Mining and industrial locomotives shipped during third quarter numbered 173, compared with 242 in second quarter and 138 during third quarter, 1940, according to the Bureau of the Census. Shipments for nine months this year totaled 565, against 396 in the same period last year.

KNOCKS DOWN both dangerous fires!

SUPPOSE a dip-tank bursts into flame . . . an electric motor catches fire? Can your extinguishers handle those blazes?

These two types—electrical and flammable liquid fires—threaten most industrial plants. LUX extinguishers are engineered to fight these blazes.

LUX equipment hits them in a blizzard of carbon dioxide snow-and-gas, lightning-fast extinguishing agent. Use LUX portables for ordinary hazards. Install built-in LUX systems for the intense hazards, like storage spaces, tanks or kettles for flammable liquids and solvents.

LUX protection means *added* protection. It means *plus* values in your plant's day-and-night safety.

HERE ARE THE PLUS VALUES IN FIRE-FIGHTING

1. LUX carbon dioxide gas is one of the fastest known extinguishing agents.
2. LUX extinguishers are effective on both electrical and flammable liquid fires.
3. LUX gas is clean, non-damaging, non-contaminating, non-toxic.
4. 45,000% expansion drives LUX gas throughout fire area, despite obstructions.
5. Annual recharging is not necessary with LUX. Simply weigh periodically.
6. LUX service depots are maintained in principal cities.

LUX SNUFFS OUT FIRE

Walter Kidde & Company

Incorporated

1132 West Street, Bloomfield, N. J.

HOW JESSOP TRUFORM OIL HARDENING TOOL STEEL Speeds up Tool and Die Production

✔ **EASE OF HARDENING**—Jessop TRUFORM is a non-deforming tool steel which can be safely hardened by a relatively inexperienced man. Die spoilage is practically eliminated.

✔ **GOOD MACHINABILITY**—Jessop TRUFORM is given a special spheroidizing anneal after hammering or rolling so that it can be easily machined.

✔ **MINIMUM SIZE CHANGE**—Jessop TRUFORM resists size change to a remarkable degree; consequently, dies seldom need to be ground after heat treatment.

If your tools and dies are of intricate shape, or must possess extreme accuracy, play safe by specifying Jessop TRUFORM Oil-Hardening Tool Steel. Descriptive folder sent free upon request.

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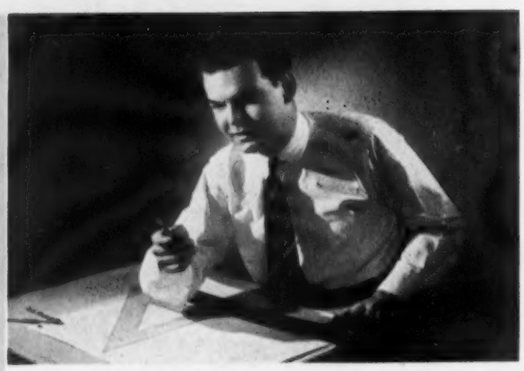
WASHINGTON, PENNA. U.S.A.
CARBON · HIGH SPEED · SPECIAL ALLOY
STAINLESS and COMPOSITE STEELS

HYDRAULICALLY BALANCED

YOU DON'T HAVE TO BE A *Specialist* TO TAKE CARE OF YOUR *Pumping* NEEDS



A MAN with average knowledge of mechanical equipment can quickly estimate the requirements of the average rotary pump job. Of course, there are installations that call for specialized knowledge, but the average installation can be figured without the aid of an expert pump technician. Briefly, all you need to know is: Liquid to be pumped, Capacity and Speed required, Size and Length of Suction and Discharge lines, Discharge pressure (if any), and type of drive desired. The Roper catalog 939 will give you complete information.

GEO. D. ROPER CORP.
ROCKFORD, ILL.

ROPER *Rotary* PUMPS

Iron Ore

Iron Ore Prices, Page 125

Shipments of Lake Superior iron ore in October totaled 9,596,064 gross tons, 4.62 per cent less than 10,061,127 tons carried in October, 1940. The decrease was 465,063 tons. Blocking of the Sault Ste. Marie canal by falling of a bridge caused the loss.

Season total to Nov. 1 was 71,620,292 tons, an increase of 13,323,938 tons, 22.86 per cent, over 58,296,354 tons moved up to Nov. 1, 1940. Movement this year has exceeded the all-time record for an entire season, 65,204,600 tons, made in 1929.

Shipments in gross toms for October were:

	October, 1941	October, 1940
Escanaba	537,488	486,443
Marquette	578,571	316,589
Ashland	636,863	942,874
Superior	3,474,146	3,345,842
Duluth	2,469,859	2,796,432
Two Harbors	1,866,703	1,620,424
U. S. ports	9,563,630	10,008,604
Michipicoten	32,434	52,523
Grand total	9,596,064	10,061,127
Decrease from year ago		465,063

Cumulative shipments for the season to Nov. 1 were:

	To Nov. 1, 1941	To Nov. 1, 1940
Escanaba	4,127,765	3,036,810
Marquette	4,907,227	4,916,793
Ashland	5,682,523	5,395,068
Superior	25,446,552	20,265,203
Duluth	17,885,276	14,609,349
Two Harbors	13,175,230	9,779,474
U. S. Ports	71,224,580	58,002,697
Michipicoten	395,712	293,657
Grand total	71,620,292	58,296,354
Increase from year ago		13,323,938

Canada

Toronto, Ont.—While there has been no improvement in Canadian steel output orders are increasing and mills report backlogs that will tax capacity for many months. Most orders are associated with war effort and the limited tonnage from non-war sources is being accepted with delivery dates indefinite. Canadian government officials have been negotiating with United States sources of supply with the object of speeding up deliveries to this country and it is reported that steel imports this year will reach an all time peak and will continue to expand throughout the war.

C. D. Howe, minister of munitions and supply, states that arrangements have been concluded with United States sources for supply of plate for two destroyers and hopes sufficient plate will be forthcoming to enable full speed ahead on the merchant shipping program. Demand for plate was given considerable acceleration with the announcement that this country will double its original merchant shipbuilding program and already contracts have been let for 19 addition-

G. A. WELDING *Shop Notes*

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26 years ago our engineers pioneered in steel plate welding fabrication with an experimental car tank. 20 years ago we began the intensive research which developed FLUID-FUSION WELDING, exclusive G. A. process. Today we offer complete steel fabricating service: Oxy-acetylene, carbon arc and resistance welding as well as riveting, to meet YOUR needs and specifications. Write or wire regarding your requirements.

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GENERAL AMERICAN TRANSPORTATION CORP.
Successor to Plate & Welding Div., Petroleum Iron Works Co. (P.I.W.)

GATX GENERAL AMERICAN
PLATE & WELDING DIVISION
PLANT AT SHARON, PA.

Offices in All Principal Cities

al ships, ranging from 4300 to 9300 tons.

Inquiry for sheets are increasingly heavy with no takers unless there is definite assurance the materials are required for war needs. The automotive industry has entered the market recently and large tonnages are pending from this source. It is generally understood, however, that if all requirements are to be met greater assistance will be necessary from United States producers. To date no actual shortage has been reported by war contractors and regular shipments are being made against higher priorities.

Little change is reported in merchant bars. Mill representatives state that orders are numerous, mostly war contracts, and while they are accepting some civilian business are unable to give definite delivery dates.

Structural steel awards showed an upward spurt during the week, totaling about 12,000 tons, while direct government construction announcements indicate about 16,000 tons pending for early closing. Fabricators report record backlogs, with plants at capacity.

Merchant pig iron sales are increasing steadily, due to increased production of foundry and malleable iron, with added demand for basic iron, but supply is below requirements. Sales for October were about 15 per cent above September and further improvement is expected for this month. Shipments to merchant melters are being made upon approval by the steel controller.

Iron and steel scrap sales are well sustained. Cast scrap is scarce and offerings are becoming fewer, with less tonnage involved. Stove plate has practically disappeared. Steel scrap supply is not keeping pace with demand. Establishment of new basing points for iron scrap has not stimulated supply, but has opened new outlets in areas where comparatively little business was done previously.

Ferroalloys

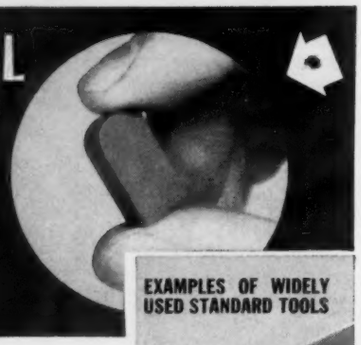
Ferroalloy Prices, Page 124

Receipt of 2500 tons of ferromanganese at Baltimore from England a few days ago is the second installment of an order for 5000 tons. These shipments are said to have been the first received from that country in a decade and the first from anywhere abroad since shortly before the war.

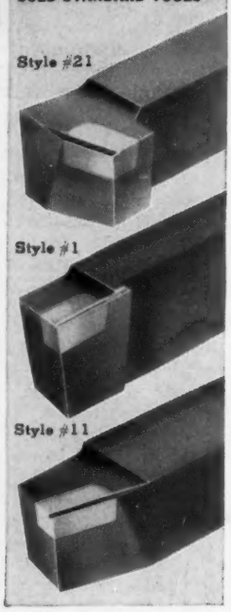
These arrivals are causing no little speculation. Some believe England could well use all the ferromanganese she could produce, while others point out that normally in peace times she exported considerable to European consumers and in absence of this market she could spare some for this country. Some surprise is expressed over the fact that if she did not actually need the alloy she could spare furnace capacity for its production. It is believed some special considerations guided this transaction.

Manganese ore shipments from abroad are short of what is needed

This KENNAMETAL TOOL TIP COSTS AS LITTLE AS $1.30



EXAMPLES OF WIDELY USED STANDARD TOOLS



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The value of metals today is measured not so much by their cost in dollars and cents as by their importance in defense production. An outstanding example is KENNAMETAL, the accepted carbide tool material for machining steel of all hardnesses up to 550 Brinell. The tool blank illustrated costs as little as $1.30 (in quantity lots), yet when brazed on the end of a tool used for turning, boring, or facing steel parts, it will reduce machining time by as much as 50%.

Prompt Deliveries on Standard Tools and Blanks

Standard and Modified Standard Kennametal tools are shipped within 10 days of receipt of order; Standard tool blanks within 3 to 4 days. Write for our new Catalog No. 42 listing specifications and prices.

McKENNA METALS Co.
LLOYD AVE., LATROBE, PENNA.
FOREIGN REPRESENTATIVES: U. S. STEEL EXPORT CO.
(Exclusive of Canada, Great Britain and Possessions)

DEFENSE WELDING
IS DEFINITELY
C-F POSITIONER WELDING

In the armament section of American Machinist for September the manufacture of arc welded gun carriages is described, in part, thusly . . . . "Since all welding is down-hand, positioners are used wherever required." The positioners shown are C-F Welding Positioners. Not only here, but throughout industry, these time-saving machines which permit faster and better welding are definitely part of the defense job, in armaments, shipbuilding, transportation; everywhere. Investigation will probably show you that C-F Positioners will make your production welding simpler and more economical.

C-F Positioners are available in hand operated or power driven machines with capacities from 1200 to 14,000 lbs.

Our bulletin W P 20 will give you the facts. It is illustrated, interesting and free upon request.

CULLEN-FRIESTEDT CO.
1308 S. KILBOURN AVE. CHICAGO, ILLINOIS

for maintaining stocks. The latter are substantial, estimated at somewhat in excess of a year's requirements. Metals Reserve Co. is negotiating for lower grades of domestic ores, reflecting interest in replacement.

Warehouse

Warehouse Prices, Page 125

Inventory replacements under the warehouse quota continue to be disappointing, plates, sheets and bars being particularly scarce. Some resellers have been able to keep volume of sales close to the September level, though stocks are badly broken. Sales against top priority orders are replaced only under the A-9 warehouse priority, causing a lag and holding down stocks. As a result only a portion of inquiry can be entertained, particularly in sheets. Some smaller jobbers accept premium prices on material badly wanted and imposition of ceiling prices on resales is expected.

Steel in Europe

Foreign Steel Prices, Page 125

London—(*By Cable*)—Great Britain's war steel requirements are expanding and output is increasing. Demand for ship and tank plates and special steels continues urgent. Greater activity is apparent in structural steel and wire rod departments. Demand is increasing for black sheets. The situation in tin plate continues difficult, owing to steel restrictions and export limitations.

Metallurgical Coke

Coke Prices, Page 123

With the captive coal mine situation quieted for the present a new threat to coke supply in the Pittsburgh district has arisen from a strike of officers on Carnegie-Illinois Steel Corp. river boats. These boats move 50,000 tons of coal daily from mines of the H. C. Frick Coal & Coke Co. to other United States Steel Corp. subsidiaries, the larger part to the Clairton, Pa., coke plant.

Coke Oven By-Products

Coke By-Product Prices, Page 123

Coke oven by-product demand continues heavy, high priority requirements and contract specifications precluding possibility of much spot volume. Production is high, at a maximum point, and as yet synthetic plants, including toluol, started since the advent of the defense emergency, have not materially eased pressure for distillates from coking operations. Demand for toluol is notably strong for munitions. While lacquer demand for automobiles is slackening, the lag is easily made up by coatings for other industries, mainly connected with defense. Position of phenol is no less tight, needs for plastics being heavy. Industrial and chemical consumption continues at a high rate for all by-products, with prices unchanged.

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BLACK *finish for* **IRON** *and* **STEEL**

★ *REPLACES STRATEGIC MATERIALS* ★

1ST in *Abrasion & Wear Resistance*
250% more abrasion and wear resistance than any black finish on the market—*guaranteed.*

1ST in *Rust Resistance*
50 hours and more, salt spray test with JETAL and Jetoil—*guaranteed.*

1ST in *Speed*
Less than half time required to obtain above results, as compared with any other method—*guaranteed*

1ST in *Economy*
In price, in treatment time and in wear resistance, 30% or more saving *guaranteed.*

Only the *JETAL* Process offers these outstanding features.

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Samples and consultation service without obligation.

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NO OTHER *POWER* PROVIDES
PEAK EFFICIENCY
24 HOURS A DAY—7 DAYS A WEEK

It's POWER *that counts!*

READY-POWER *the continuous power*
THAT MAKES TRUCKS GO

★ With READY-POWER (a gasoline-electric power plant for electric truck operation) truck speed is maintained and maximum tonnage is handled every hour throughout the day. Write for descriptive literature.

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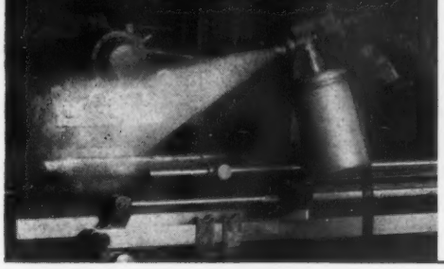
PREVENT CORROSION!



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OR DIP IT!

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Efficacy proved by years of use in leading Machine Tool and other plants.
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SAFETY LETTERS and FIGURES

Heavy Bevel Style

Any size from 1/16" to 1/2"
No SPALLING!
No MUSHROOMING!

Safety Steel assures at least 50% more service.

Recommended for stamping armor plate shell forgings, airplane parts, and other Defense products.

WIRE or AIRMAIL for your immediate requirements.

Write for circular and prices.

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QUALITY GEARS

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THE SIMONDS GEAR & MFG. CO.
25TH STREET, PITTSBURGH, PA.

Construction and Enterprise

Michigan

ANN ARBOR, MICH.—International Industries Inc. has awarded contract to Austin Co., Detroit, for erection of factory building.

DETROIT—Parker Rust-Proof Co., 2177 East Milwaukee, will erect factory building in Morenci, Mich. Smith, Hinchman & Grylls, 800 Marquette building, Detroit, architects.

DETROIT—Odel Tool & Die Co., 4670 Algonquin, has let contract to Stibbard Construction Co., 3000 Grand river, for addition to shop.

DETROIT—American Metal Products Co. has awarded contract to Bryant & Detwiler Co., 2304 Penobscot building, for addition to plant.

DETROIT—Bennage & McKinstrie, 4612 Woodward, have contract for addition to factory and office building of Linderme Machine & Tool Co. Inc.

DETROIT—Rodgers Aviation Diesels Inc., 454 Twenty-first street, has been incorporated with $50,000 capital to manufacture aircraft and marine motors, by Edward T. Rodgers, Hotel Madison-Lennox.

DETROIT—Ace Mfg. Co., 6460 Benham road, has been incorporated with $100,000 capital to manufacture castings, by Roy J. Owens, 5048 Iroquois avenue.

INKSTER, MICH.—Micro Machining Co., Inkster, has been organized to manufacture tools; Rudolph Rabe, 8949 South Telegraph road.

NIRVANA, MICH.—Nirvana Mfg. Corp. has been organized with $10,000 capital to engage in tool and die work, by Joseph F. Wilhelm, Nirvana.

WYANDOTTE, MICH.—E. I. du Pont de Nemours & Co. Inc., Wilmington, Del., is preparing plans for a solvents plant to be erected here. Estimated cost $5,500,000.

Additional Construction and Enterprise leads may be found in the list of Shapes Pending on page 131 and Reinforcing Bars Pending on page 132 in this issue.

Massachusetts

BOSTON—Meisel Gear Co. will build one-story addition, 50 x 165 feet, to be financed by Defense Plant Corp. Cost about $1,682,500 with equipment.

EVERETT, MASS.—L. J. Harwood Mfg. Co. will build one-story addition, 50 x 165 feet, to cost $60,000 with equipment.

SPRINGFIELD, MASS. — American Bosch Corp. will add 57,000 square feet to its production space. Defense Plant Corp. will bear $400,000 of total cost of $700,000.

SPRINGFIELD, MASS.—Package Machinery Co. will build an addition to its plant costing $15,000.

SPRINGFIELD, MASS.—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., will build a one-story 120 x 300-foot manufacturing plant at East Springfield, costing about $60,000.

WINTHROP, MASS.—T. Key, chairman of the board of selectmen, Town Hall, is making a preliminary survey for a rubbish and refuse incinerating plant costing over $25,000.

WORCESTER, MASS.—New England Metallurgical Co. is erecting a one-story addition. Cost, with equipment, $40,000.

New York

BATH, N. Y.—Steuben Electric Association, Arthur M. Seaman, president, will erect 712 miles of transmission lines in Steuben and Schuyler counties to serve 1732 customers, for which REA has allotted $664,000.

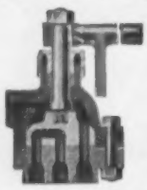
BELMONT, N. Y.—REA has allotted $311,000 to the Genesee Valley Electric Association, W. Glenn Talbolt, president, for construction of 324 miles of rural transmission lines to serve 799 customers.

BINGHAMTON, N. Y.—Stow Mfg. Co. is erecting a one-story addition to its plant, 55 x 100 feet, to cost about $11,350.

DELHI, N. Y.—REA has allotted $307,000 to Delaware County Electric Association, Gordon P. Gleason, president, to finance construction of 309 miles of transmission lines.

MASSENA, N. Y.—Aluminum Co. of America will soon begin construction of mill here, to cost approximately $15,000,000. Raymond Whitzel is plant superintendent.

ONEONTA, N. Y.—Otsego Electric Association, Alfred Monson, president, has



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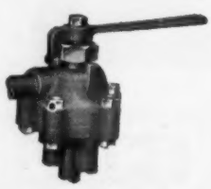
FOR OPEN HEARTH FURNACES
By NICHOLSON

It answers a long-felt need among open hearth operators, because it alternates the flow of oil and steam to the oil burners on the furnaces without showing signs of leakage or wear. For use on air, steam, water or oil up to 300 lb. pressures, this valve can't be surpassed. Our catalog No. 140 carries concise descriptions of this and other valves: foot, solenoid and motor operated. Catalog on request.

PRESSURE-TIGHT SERVICE AT LOW COST

The Nicholson lever-operated style J valve for air or oil pressures up to 125 lbs. was introduced to meet the demand for a low-priced valve. Least expensive of the Nicholson valves, it gives the same trouble-free service that the larger and more expensive valves do. It, too, is described in our catalog No. 140.



OTHER NICHOLSON PRODUCTS:
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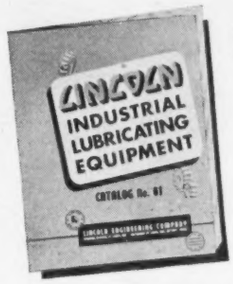

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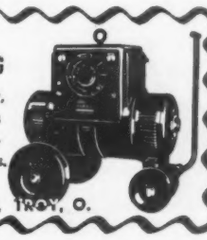

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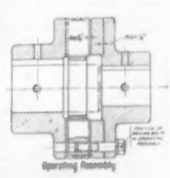
EASY TO GET AT! *L-R Type WO permits rotation of either shaft, timing of engine or renewal of either element without teardown of coupling or moving machine.*

Time-saving non-lubricated coupling available with bores up to 11". Catalog ready, free—Write.



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ANY METAL • ANY PERFORATION

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New York Office—114 Liberty St.

REA allotment of $432,000 for constructing 442 miles of transmission lines to serve 1128 customers.

TROY, N. Y.—Trojan Mfg. Co. Inc. has been organized with 500 shares of no par value, to manufacture hand wheels, machines parts, etc. Kavanagh, Armsby & Purcell, Cannon building, Troy, representatives.

New Jersey

TRENTON, N. J.—E. J. Scudder Foundry & Machine Co. has let contract for factory addition to cost $4000.

TRENTON, N. J.—DeLaval Steam Turbine Co. has awarded contract for factory addition to cost $22,000.

Ohio

ELYRIA, O.—Couch Uthe Co., Olive street, manufacturer of screw machine products, is starting a $12,500 plant expansion.

LORAIN, O. — White-Roth Machine Corp., newly organized, has acquired plant of Brunk Machine & Forging Co. at 947 Broadway. Building will be remodeled and new machinery and tools installed.

MANSFIELD, O.—Humphrey Mfg. Co., Wayne street, has let contract for remodeling its foundry. Cost estimated at $18,000.

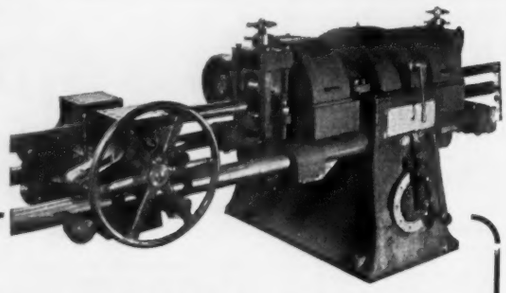
WARREN, O.—Defense Plant Corp. has approved appropriation of $4,600,000 for new plant facilities to increase production of electric alloy steel at Warren plant of Copperweld Steel Co. The company is making changes in existing machinery and equipment separate from expansion financed by Defense Plant Corp. (Noted Oct. 20).

Pennsylvania

BEAVER FALLS, PA.—Babcock & Wilcox Tube Co. has received approval on financing for $970,000 steel plant to be built through Defense Plant Corp.

CORRY, PA.—City, G. B. Poster, clerk, has plans for sewage disposal plant to cost approximately $450,000. Havens & Emerson, Leader building, Cleveland, are consulting engineers.

MEDART Type HF
Continuous Automatic
Centerless Bar Turner



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High speed turning machines for turning round bars and tubes — automatic and continuous production — adaptable to precision turning or rough peeling — available in several types.

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Alabama

CHILDERSBURG, ALA.—War department has allotted $380,000 additional funds for expansion of Alabama ordnance works.

CRICHTON, ALA.—J. E. Paterson, Dauphin, Mobile and associates, have acquired 3½ acre site here for erection of plant to manufacture plastics and synthetic rubber from wood saw dust.

Missouri

BOLIVER, MO.—Southwest Electric Co-operative, D. L. Alexander, project superintendent, plans construction of 320 miles of rural transmission lines, for which REA has allotted $300,000. Midwestern Engineering & Construction Co., McBirney building, Tulsa, Okla., consulting engineer.

ST. LOUIS—Omar Tool & Machine Co., 1828 North Seventeenth street, will build new plant, one story, 75 x 150 feet, Palm street and Natural Bridge avenue. Cay G. Weinel, 6635 Delmar boulevard, University City, is architect.

ST. LOUIS—Mines Equipment Co., 4215 Clayton avenue, has let contract to Shasserre Construction Co., Fullerton building, for a two-story addition 100 x 150 feet. Norman I. Bailey, 26 Fern Ridge road, is architect.

ST. LOUIS—Defiance Machine & Tool Co., Roy Schact, president, 719 South Sarah street, has been organized to manufacture machine tools.

ST. LOUIS—Reconstruction Finance Corp., in connection with national defense program, has authorized loan of $100,000 to Dixie Machinery Mfg. Co. for expansion.

Arkansas

PINE BLUFF, ARK.—War department has authorized Chemical Warfare Service to build incendiary bomb plant at estimated cost of $36,000,000 on 5000-acre site near here. Estimated output will be 3,000,000 bombs per month. Government will own plant and operation will be by agent.

Wisconsin

BELOIT, WIS.—Fairbanks, Morse & Co., Chicago, has received authorization to erect a $5,500,000 addition to its Beloit plant, for manufacture of diesel motors for the Navy. The new building, 460 x 660 feet, will contain 300,000 square feet of floor space.

CLEAR LAKE, WIS.—Public Service Commission has authorized construction of 1200-kilowatt diesel generating plant to cost $142,000, by the Wisconsin Hydro-Electric Co., R. M. Houger, president.

Minnesota

BENSON, MINN.—REA has allotted $1,500,000 to Western Minnesota Power

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SHEETS TIN PLATE
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THE MODERN TIN PLATE
WHEELING STEEL CORPORATION
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ROTARY SLITTING KNIVES
for Modern Requirements
Highest Quality . . . . Long Service
The Product of Many Years Specialization
MADE BY TOOLMAKERS
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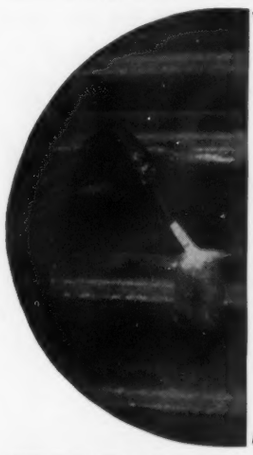
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CAN BE EASILY AND QUICKLY RE-SURFACED EQUAL TO HOT-DIP GALVANIZING
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EACH HARPER bolt, nut, screw, washer, rivet or other fastening is made of one or another of the metals listed at the left . . . resists rust, corrosion and other tough conditions. Easily cleaned.
Every facility of the Harper plant is pledged to serve the interests of . . . NATIONAL DEFENSE and important industrial requirements.
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COAL COKE PIG IRON
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PROMPT AND EFFICIENT SERVICE
OFFICES: OLIVER BUILDING, PITTSBURGH, PA. AT. 5325
CINCINNATI OFFICE: CAREW TOWER

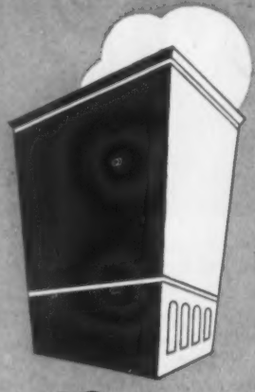
co-operative, E. L. Smith, president, to finance construction of generating facilities.

MOUND, MINN.—Village, L. V. Alvin, clerk, will hold bond election soon to finance construction of sewage disposal plant to cost about $80,000. Druar & Milinowski, 1411 Pioneer building, St. Paul, are consulting engineers.

WASECA, MINN.—City will soon make application to WPA for funds to finance construction of sewage disposal plant and sewer extensions. Estimated cost $65,000. Toltz, King & Day, 1509 Pioneer building, St. Paul, are consulting engineers.

Texas

HOUSTON, TEX.—Eastern States Petroleum Co. Inc., Keller building, plans construction of $1,000,000 refinery.



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is won through ability to place comfortable accommodations at your disposal . . . serviced to your satisfaction . . . priced to fit your requirements . . . so that you'll "tell the folks back home."

DETROIT LELAND HOTEL

800 OUTSIDE ROOMS ALL WITH PRIVATE BATH . . . SINGLE FROM $2.75 . . . DOUBLE FROM $4.50

CHARLES H. LOTT
General Manager

HOUSTON, TEX.—Sheffield Steel Corp., Kansas City, Mo., has applied to Office of Production Management, Washington, for approval of expansion of $12,000,000 plant now under construction here, with addition to cost approximately $20,000,000.

PORT ARTHUR, TEX.—Texas Steel Mfg. Co., A. J. Armstrong, vice president, 3901 Hemphill street, Fort Worth, Tex., has let contract for shell case and forgings plant to H. E. Beyster Corp., same address, to cost about $1,260,000. (Noted Oct. 6.)

Kansas

IOLA, KANS.—Allen County Co-operative Power & Light Co. will take bids Nov. 25 on construction of 225 miles of transmission lines to cost about $207,000. Paulette & Wilson, 1006 Kansas avenue, Topeka, Kans., consulting engineers.

Iowa

DECORAH, IOWA—Interstate Power Co. plans enlargement of its power plant, including steam power generating equipment and also a substation. Cost estimated at $1,000,000.

VINTON, IOWA—Benton County Electric Co-operative Association plans construction of about 140 miles of rural electric lines to cost about $123,000, for which REA has allotted funds.

Wyoming

PINE BLUFFS, WYO.—Rural Electric Co., George N. Phillips, superintendent, will complete plans about Nov. 15 for construction of 703 miles of transmission lines.

Nevada

LUNING, NEV.—MacDonald Engineering Co., 1 North LaSalle street, Chicago, has been awarded contract for erection of 3000-ton concentration plant here for Basic Magnesium Inc., 735 Hanna building, Cleveland. Plant will house crushing, grinding, flotation and calcining equipment. Estimated cost $3,000,000.

California

DOWNEY, CALIF.—An addition to the aircraft plant of Vultee Aircraft Co., here, will cost $31,000.

GLENDALE, CALIF.—Two machine shops will be erected at 807 Norton street and at 5952 San Fernando road, Glendale, for J. V. Kuhns Jr., 1154 West Broadway, Long Beach, Calif. Estimated cost $6700.

HAWTHORNE, CALIF.—Northrop Aircraft Inc., 1001 East Broadway, has awarded contract for construction of additions to aircraft factory, to cost $60,000.

LONG BEACH, CALIF.—Contract has been awarded to Walker Construction Co., 3900 Whiteside avenue, Los Angeles, for additions to Douglas Aircraft plant here, including engineering building, service hangar, two subassembly and final assembly structures, mill building, maintenance building and addition to receiving plant.

LOS ANGELES—Precision Tool Grinding Inc. has been organized with 1000 shares of no par value stock. Directors are: William and Catherine Jovinen, Huntington Park, Calif., and V. E. Jovinen, Los Angeles. Schooling & Wayte, 6308 Pacific boulevard, Huntington Park, Calif., are representatives.

LOS ANGELES—Metals Engineering Production Corp. has been organized by K. H. Grayson, E. H. Roth and L. A. Wittliff, all of Los Angeles. R. D. Garner, 433 South Spring street, Los Angeles, is representative.

LOS ANGELES—Alterations and improvements to the factory building of General Metals Corp. at 5701 South Boyle avenue, are under way at cost of $15,000.

LOS ANGELES—Standard Pipe & Supply Co., 4441 Santa Fe avenue, is erecting a shop building, 50 x 100 feet, to cost approximately $4800.

LOS ANGELES—Parent Bros. are building a machine shop at 3341 Union Pacific avenue, to cover an area 39 x 98 feet, and to cost $4800.

LOS ANGEL$S—Kennedy & Shintz, 1011 South Fremont avenue, is erecting an addition to its machine shop, 23 x 98 feet.

LOS ANGELES—M. P. McCaffrey Co. will construct addition to machine shop and to storage building. Cost estimated at $6600.

LOS ANGELES—Hughes Aircraft Co. has been granted permit to build power house, 50 x 101 feet, to cost $12,000.

LOS ANGELES—Interaircraft Machine Shop has been incorporated with capital of $25,000 by G. L. Sterling Jr., Idalois Graham and Bertha Gries, all of Los Angeles. O'Melveny & Myers, 433 South Spring street, Los Angeles, representative.

Canada

MEDICINE HAT, ALTA.—City council is completing plans for construction of power plant addition and installation of new equipment to cost about $275,000.

NEW CASTLE, N. B.—New Brunswick Telephone Co., St. John, N. B., has awarded general contract to Deacon Construction Co., Fredericton, N. B., for power plant addition, and installation of turbogenerator unit to cost about $200,000.

KINGSTON, ONT.—Canadian Industries Ltd., 1135 Beaver Hall Hill, Montreal, will spend additional $1,000,000 on nylon plant under construction here, to increase capacity from 400,000 pounds to 1,000,000 pounds per year.

TORONTO, ONT.—Swift Canadian Co. Ltd., St. Clair avenue West, and Keele street, will build addition to cost $100,000.

TORONTO, ONT.—Toronto Shipbuilding Co. has given general contract to Fraser-Brace Engineering Co. Ltd., 107 Craig street West, Montreal, for erection of plant additioin to cost $500,000, with equipment.

WELLAND, ONT.—Atlas Steels Ltd., Main street East, now engaged in construction of plant addition, has acquired property on which it proposes to erect further additions, for which plans are being prepared by Prack & Prack, Pigott building, Hamilton, Ont. (Noted Sept. 22).

LIVERPOOL, N. S.—Thompson Bros. Machinery Co., Water street, is having plans prepared for plant addition to cost, with equipment, about $35,000.

LONGUEUIL, QUE.—Canadian Pratt & Whitney Co. Ltd., Lorne avenue, will build engine test plant and other additions to cost $70,000. General contract awarded to Sutherland Construction Co., 1440 St. Catharine street West, Montreal.

LONGUEUIL, QUE.—Fairchild Aircraft Ltd. will erect hangar and boiler house to cost $26,000, and has given general contract to Deakin & Stewart Ltd., 1440 St. Catharine street West, Monreal.

MONTREAL, QUE.—Canadian Vickers Ltd., Place d'Armes, will build plant for production of marine boilers, to cost $1,000,000, with equipment, and is having plans prepared by T. Pringle & Son Ltd., 485 McGill street.

VALCARTIER, QUE.—Department of Munitions and Supply, Ottawa, is receiving bids for construction of small arms experimental station here to cost about $75,000. H. H. Turnbull is secretary.

. *with* UNION FREECUT

free-machining Bessemer Screw Steel

Today, when higher and still higher mass production of precision parts—*WITHOUT SACRIFICE OF QUALITY*—is the first problem of steel parts manufacturers, the consistent uniformity of Republic UNION FREECUT continues to make it the most popular Bessemer Screw Steel among automatic screw machine operators.

And it should be! The UNION FREECUT of today represents the results of 52 years of constant research and study of machining problems. Here is a steel which has enjoyed development after development to increase machinability, lengthen cutting tool life, produce a smooth, lustrous machined surface—*without sacrifice of physical properties or soundness.*

UNION FREECUT is an *ADVANCED* Bessemer Screw Steel that machines with a fine, broken-up chip. Its improved machining characteristics are uniform throughout every bar and throughout shipment after shipment. And while no general claims are made for cutting speeds and feeds in excess of accepted standards, production increases up to 25% have been reported in many instances.

To help parts producers obtain the highest efficiency in their manufacturing processes, we offer the table of recommended cutting speeds and feeds on the opposite page as a guide. Figures are approximate —represent averages for the general run of steel parts. Extraordinary features in the part, the type of equipment employed and the set-up may require some alteration to best suit specific needs, as each part and each job presents its individual problems.

Ordinarily, die chasers for use with UNION FREECUT should be ground with a hook of 10°; threading surface speeds of 40 to 60 feet a minute are possible. For customary work, the regular drill point angle of 59° is satisfactory.

UNION FREECUT can be cyanided or carburized. It should be quenched at 1600° F. from cyanide for best core strength and carburized only to develop a hard wear-resisting surface. It must be remembered that, like all Bessemer steels, core strength is comparatively low.

Average physical properties for one-inch round, cold drawn, are:

Tensile Strength . . 80/100,000 lbs. per sq. in.
Yield Point . . . . . 70/80,000 lbs. per sq. in.
Elongation in 2″ . . 10/20%
Reduction of Area . 40/50%
Brinell Hardness . . 170/202

For all-around quality in duplicate steel parts and low cost per piece, keep UNION FREECUT in mind. If, however, your equipment is capable of top speeds and the nature of the part lends itself to high speed-heavy feed production, it may be well to investigate high-sulphur UNION SUPERCUT—the fastest-machining Bessemer Screw Steel made today.

Should you encounter difficulties or unusual problems in the use of Republic UNION COLD DRAWN STEELS, you may save valuable time and money by consulting us immediately. The vast experience of Union Drawn metallurgists and engineers has provided the solution to many vexing problems. Union Drawn Steel Division, Republic Steel Corporation, Massillon, O.

Republic UNION COLD DRAWN STEELS

Behind the Scenes with STEEL

Ardent Readership

■ This story came to us second hand but we'll vouch for the general substance if not all the details.

A month ago in a hotel room in Atlantic City a dozen or so men were having one of those typical sessions that follow a full day of conventioning. This group at the Hardware Convention were hard working top executives of leading metalworking plants throughout the country. There were no doubt the usual drinks and the usual stories but these men, like Isaac Black, president, Russel & Erwin Mfg. Co., New Britain, Conn., were much more interested in the problems they had brought with them from their desks—problems we all have in these hectic days of defense.

And so one man in the group remarked: "Things are happening so fast today I find it practically impossible to keep really well informed on just the developments in my own field."

"Do you read STEEL?" asked Mr. Black, and although we may not be quoting him exactly, he went on to add, "I read STEEL regularly and feel that it keeps me better informed than any other business paper."

We just thought that you, too, would be interested in this comment of a man whom we feel confidently is typical of thousands all through the industry who look to STEEL as "my" paper.

Origin Of An Idea

■ Steelmen came by car, railroad and plane last week to take a look at the new 7 roll round straightener previewed by Sutton Engineering Co. at their Bellefonte, Pa., plant. They found it quite a revelation, and rightly so, but the interesting thing to us was in Mr. J. Blair Sutton's explanation of how it came to be developed. Ten months ago during a telephone conversation with a customer, Mr. Sutton began the new design with a brief description over the phone and went to work. Less than a year later, a 71,000 lb. machine on display—and all on account of a phone call.

Defense Menu

■ Highspot of the recent meeting in Buffalo of the Metallic Belt-Link committee of the Ordnance Department was the following menu served for lunch at the Hotel Statler:

30 & 50 Caliber Fruit Cocktail

Mixed Gill a la Ordnance
Grit Blasted Lamb Chops
Heat-Treated Bacon
Calibrated Sausages
Mushrooms Rejected
Profile-Gaged Sweet Potatoes

Case-Hardened Rolls
Die-Stamped Salad with Rust Ban Dressing
Annealed Ice Cream
Zinc-Coated Cakes
Coffee Cyanide

And then, we suppose, if they lived through that *blitzkrieg* it was every man for himself.

Flatter Than Flat

■ We've been flat in our day, and from the looks of the tax experts' latest ideas of assault and robbery, we'll be flatter yet but nothing to compare with the steel valve used by the Westinghouse Lamp Division to exhaust air from light bulbs. It, so they tell us, has a surface so flat that its irregularities must be measured in light waves to within two-millionths of an inch!

Telling 'Em Off

■ We told a couple of weeks ago about the country editor who was fed up and going to quit but the editor of the Moreland, Kansas *Monitor* sees his job in an entirely different light. His recent editorial read:

"I have been criticized quite a little by some of the town smart alecks for using poor grammar. Now I have three good reasons for this.

"In the first place, if I did use good grammar half of you wouldn't understand it.

"In the second place, I couldn't do it if I wanted to.

"And third, if I did speak and write correct English, I might be managing some big New York paper at a large salary and you farmers would lose the best editor in Graham County."

Bouquet

■ Such a nice white orchid as Richard Stone of Vesuvius Crucible Co., Swissvale, Pa., sent us last week should have its place in the sun. He writes:

I believe STEEL has done a very fine piece of work in regard to the defense program and that its informative pages are of real value in enabling your readers to co-operate effectively in the effort.

A Visit To Washington

■ We really never intended to turn this page into a poetry department but this little ditty in the October bulletin of the Gray Iron Founders' Society seemed worth a little further distribution:

Did you ever go to Washington on National Defense
To do your bit for Uncle Sam and really make some sense?
Did you ever try to fix it up to see Commander D.,
Chief of Operations of the A. B. C.,
Or Mr. Smith, or Mr. Cree or Mr. Zilch or Mr. Lee,
The Honorable Directors of the E. F. G.?

Have you waited in the ante-room or waited in the hall
And spent your time and substance just to get nowhere at all?
What do their minions tell you while you sit in awed suspense?
That each and every man of them's engaged in Conference.
In the morning, in the evening, at high noon and at midnight,
Their telephones are ringing but their doors are shut up tight.

You see folks milling in and out, a never-ebbing tide,
But you can wait and wait and wait and never get inside.
You may wonder what this has to do with National Defense—
And pitying looks will follow you because you are so dense.
So if you ever feel the urge to make another call,
You'd better bring that old pup tent and camp out in the hall
With your rations and your liquor and your favorite book and all.

For by now you know the answer—
Our efforts are immense
And the greatest War in History will be won by Conference!

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